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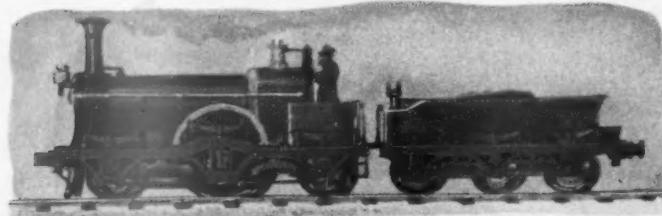
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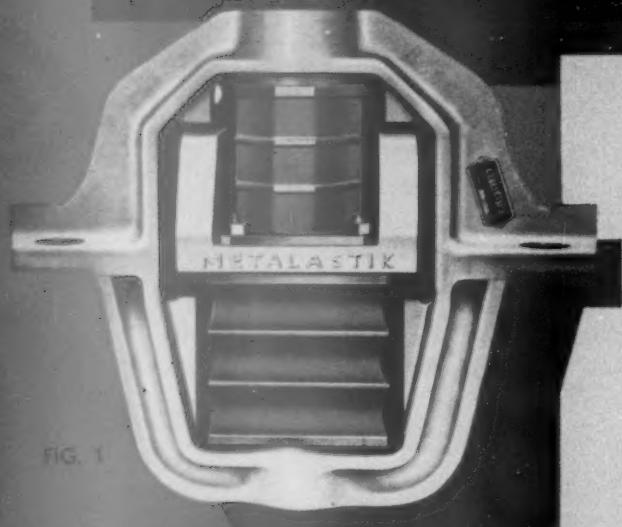


FIG. 1



FIG. 2

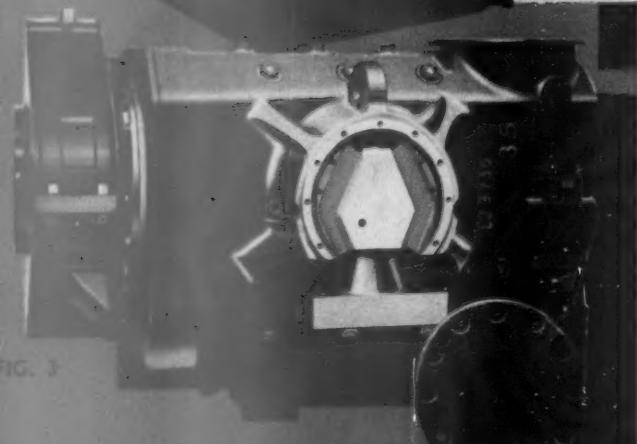


FIG. 3

FOR AXLE-HUNG TRACTION MOTORS

Solving the complex problem of nose-suspension, Metalastik designs provide as much vertical deflection as required and enough flexibility to accommodate without frictional wear or noise all relative horizontal pitching and rolling movement of the motor and bogie transom. In general they may be divided into two main classes: those in which lateral thrust is taken by the axle sleeve bearings or other means and types with chevron-shaped rubber springs which resist lateral thrust.

The suspension in Fig. 1 has little lateral stiffness and a 400 h.p. motor on this design can be moved easily from side to side within the end play of its sleeve and axle bearings.

Fig. 2 shows a Crompton Parkinson motor with chevron-type nose suspension which has high resistance to relative transverse movement (due to compression of the rubber) but little resistance to rolling and tipping of the motor. The lower arms of the chevrons also carry the static weight of the motor nose and they are longer than the upper arms for this reason.

The chevron-suspension in Fig. 3 is for an A.E.I. (B.T.H.) motor. The upper arms of the chevrons are longer than the lower arms in this design as the direction of the static load is reversed.

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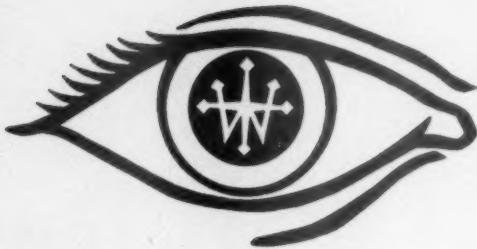
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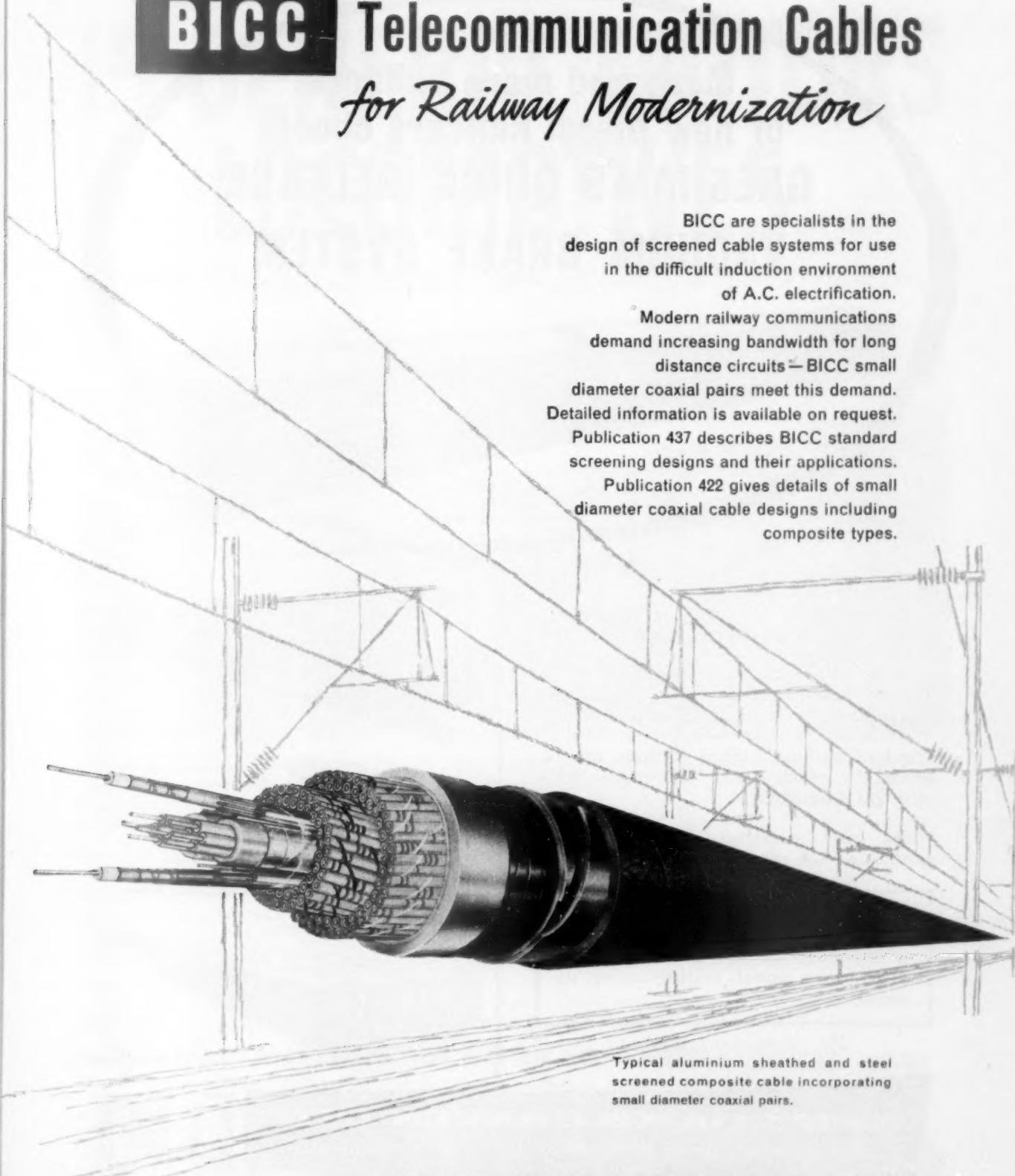
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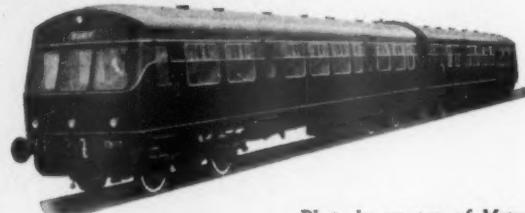
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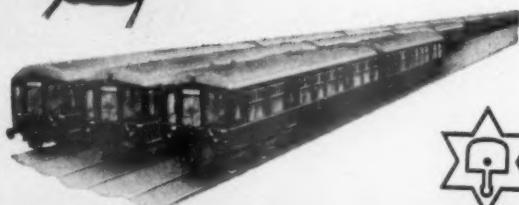
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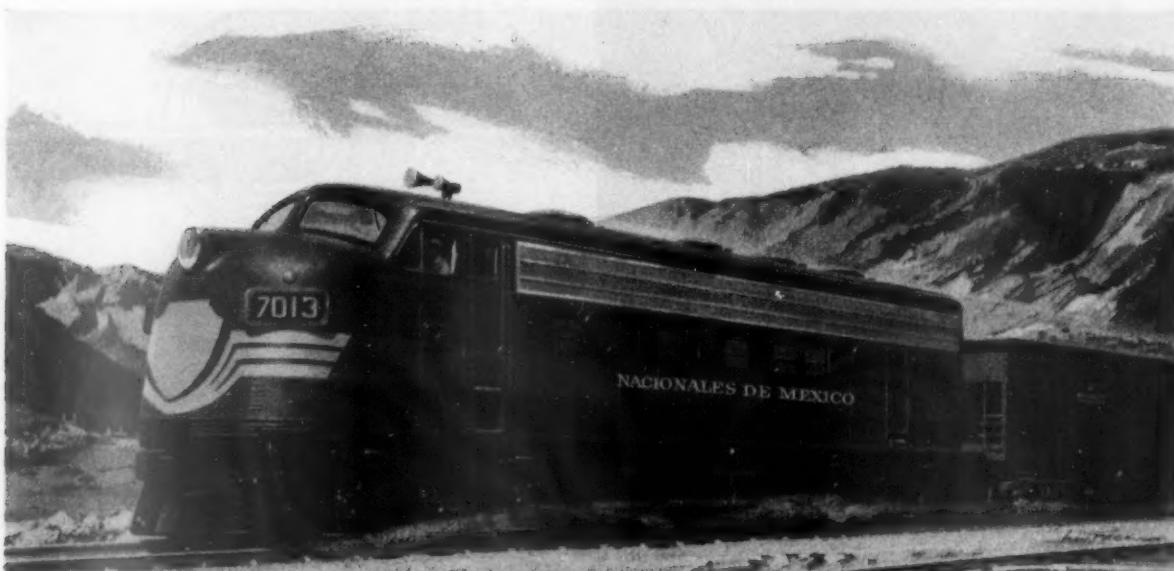
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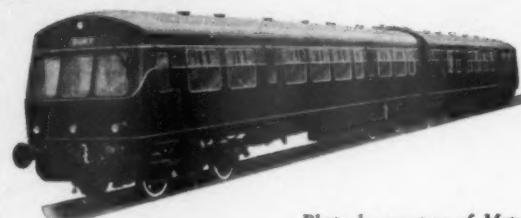
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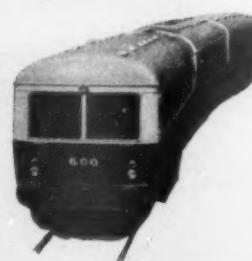
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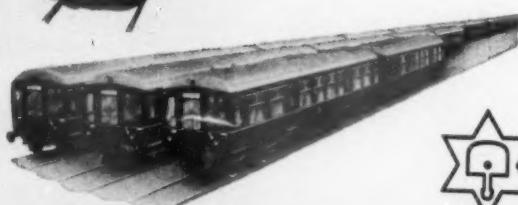
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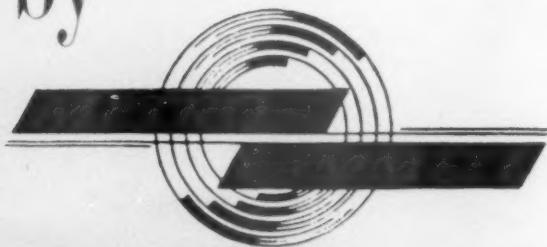
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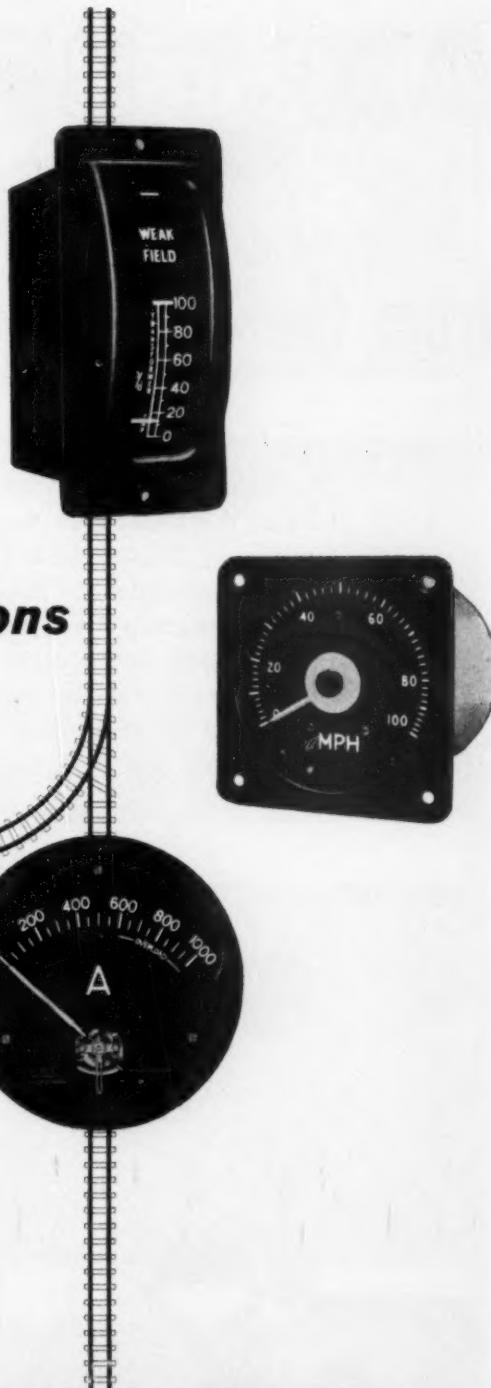
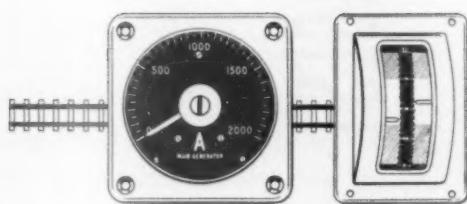
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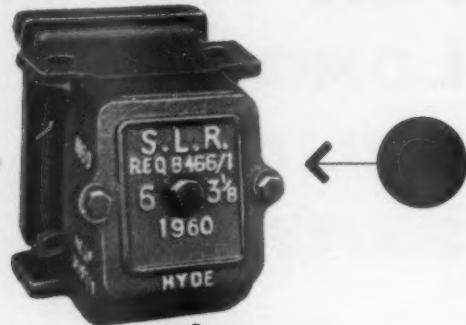
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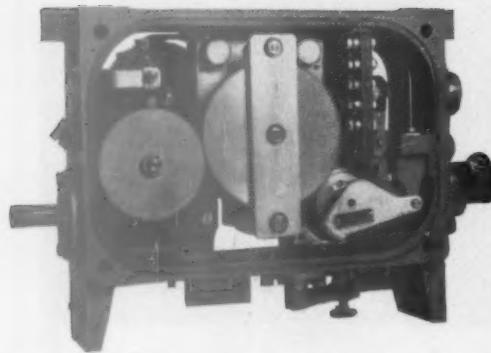


The Nigerian Railway Corporation have recently put into service two of these Twin Unit Diesel Railcars, supplied by the Drewry Car Co. Ltd., and built by Birmingham Railway Carriage and Wagon Co. Ltd. Each unit is fitted with Metcalfe-Oerlikon Patent Safety & Vigilance Control Equipment.



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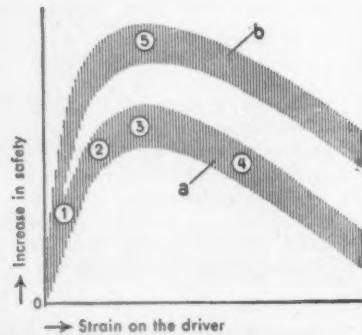
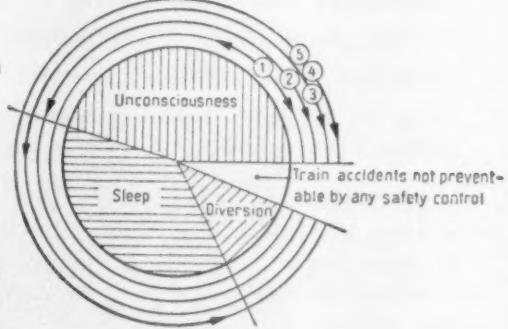
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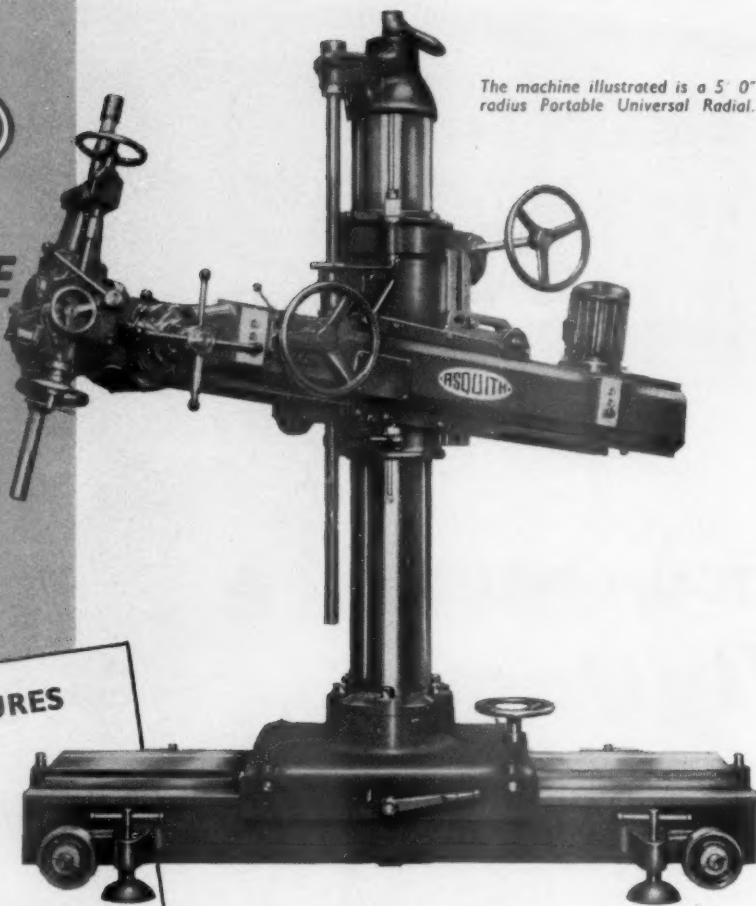
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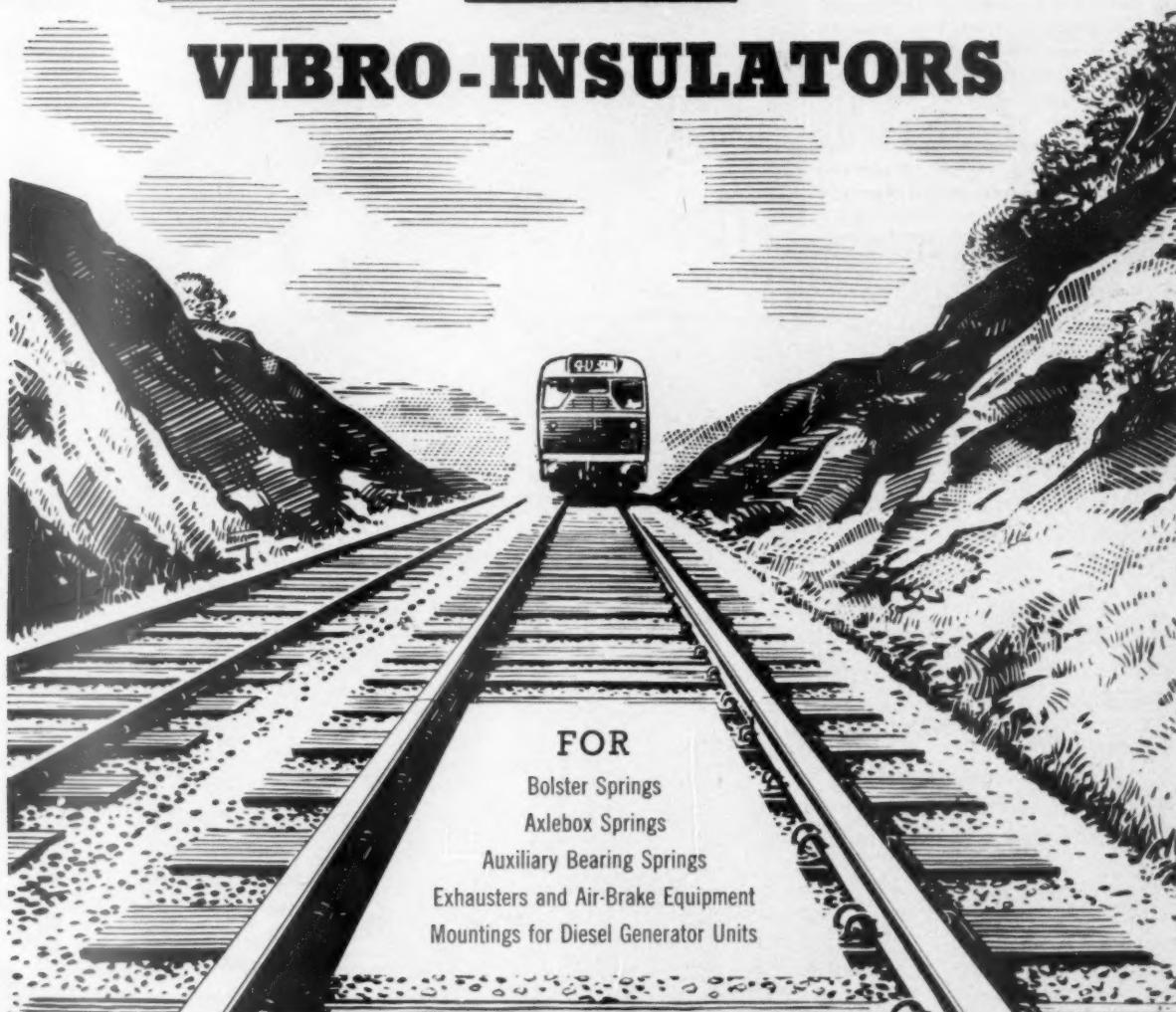
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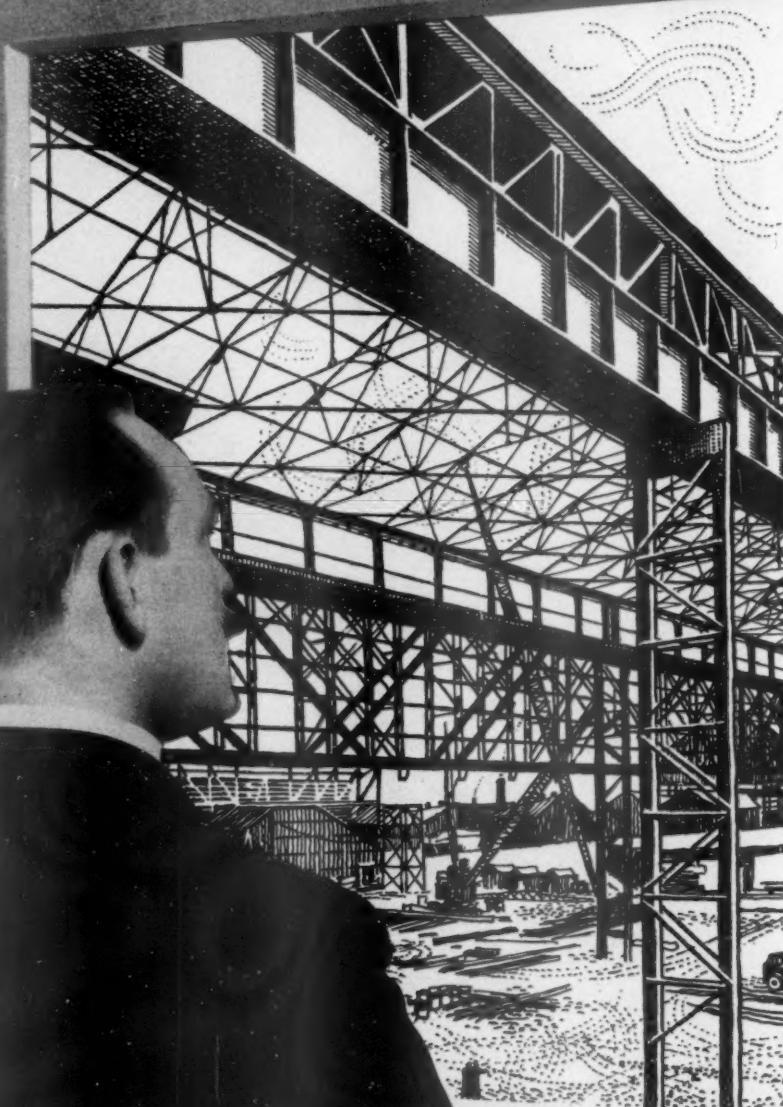


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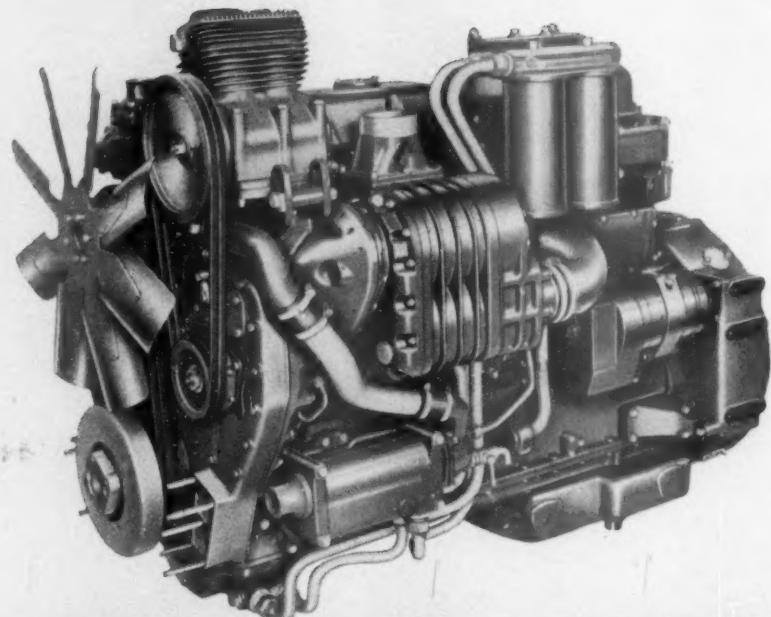
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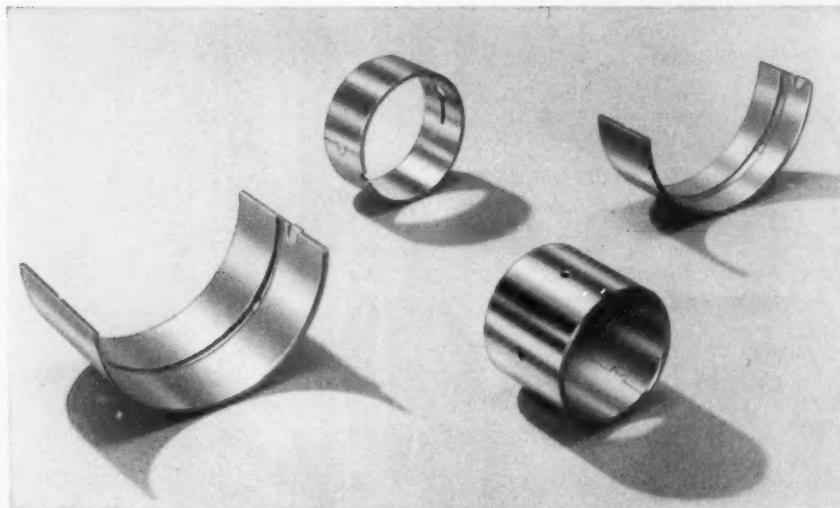
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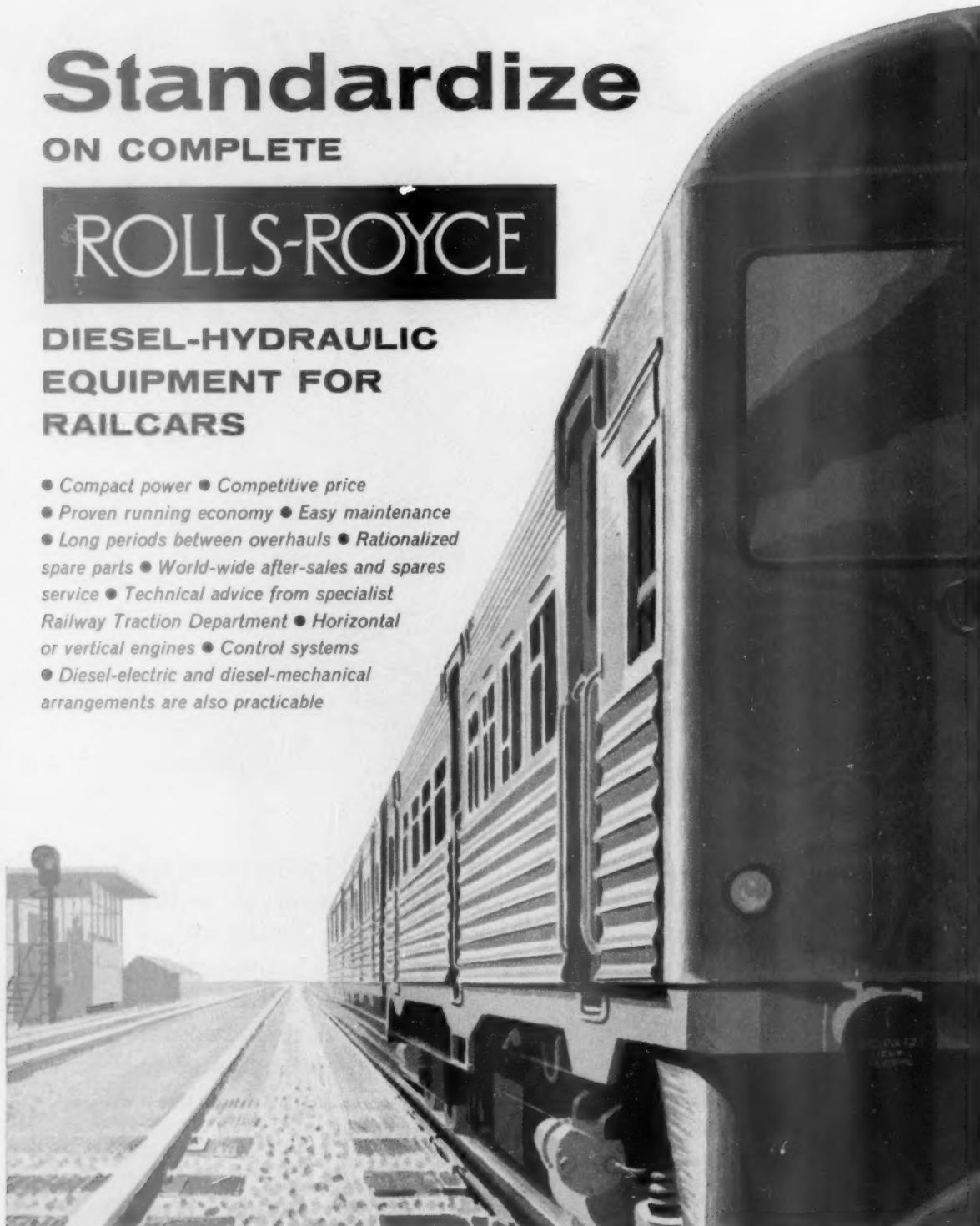
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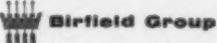
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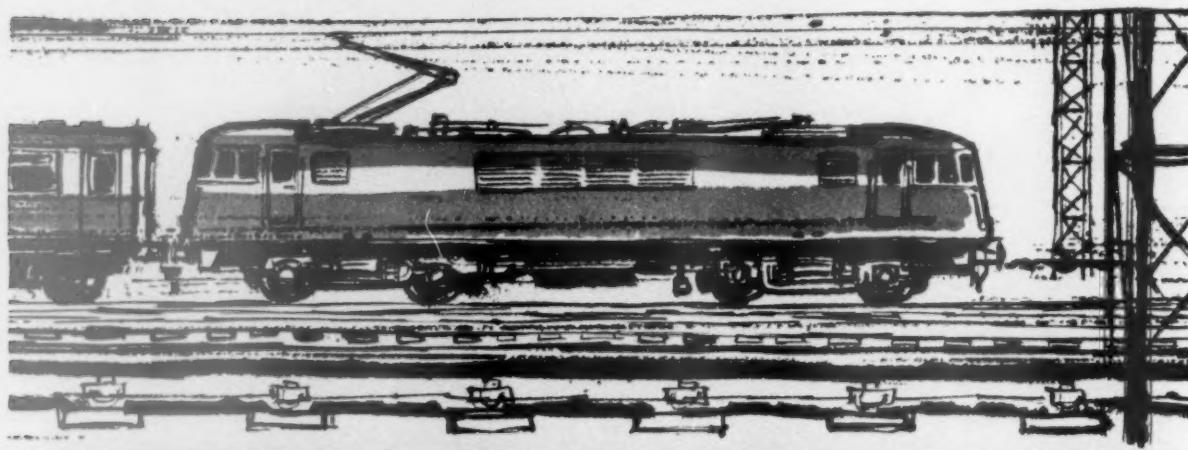


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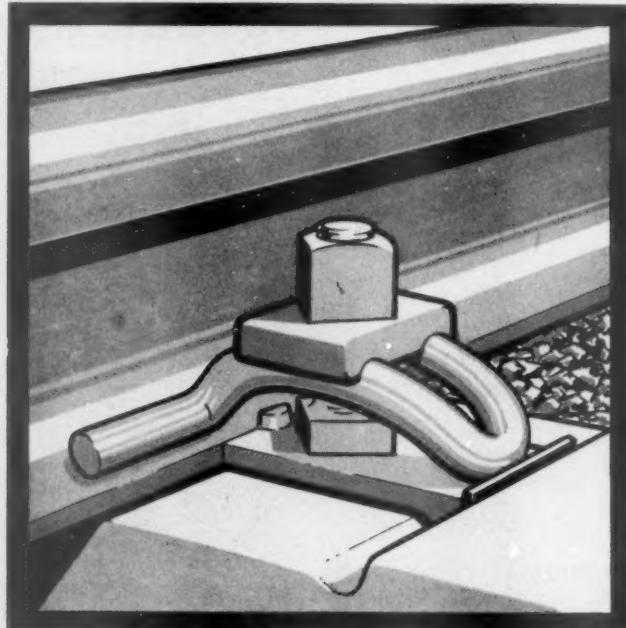
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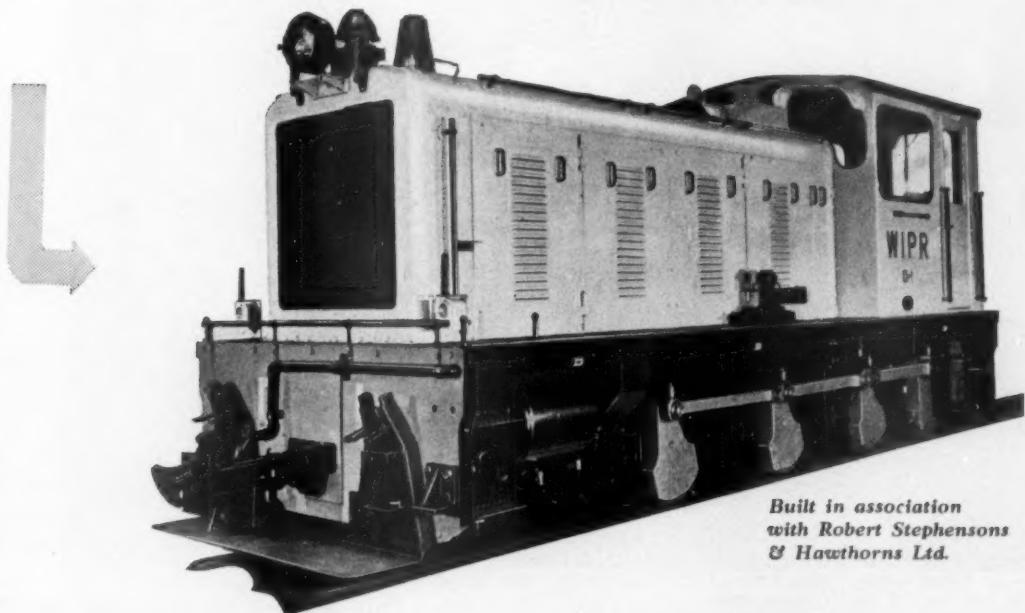


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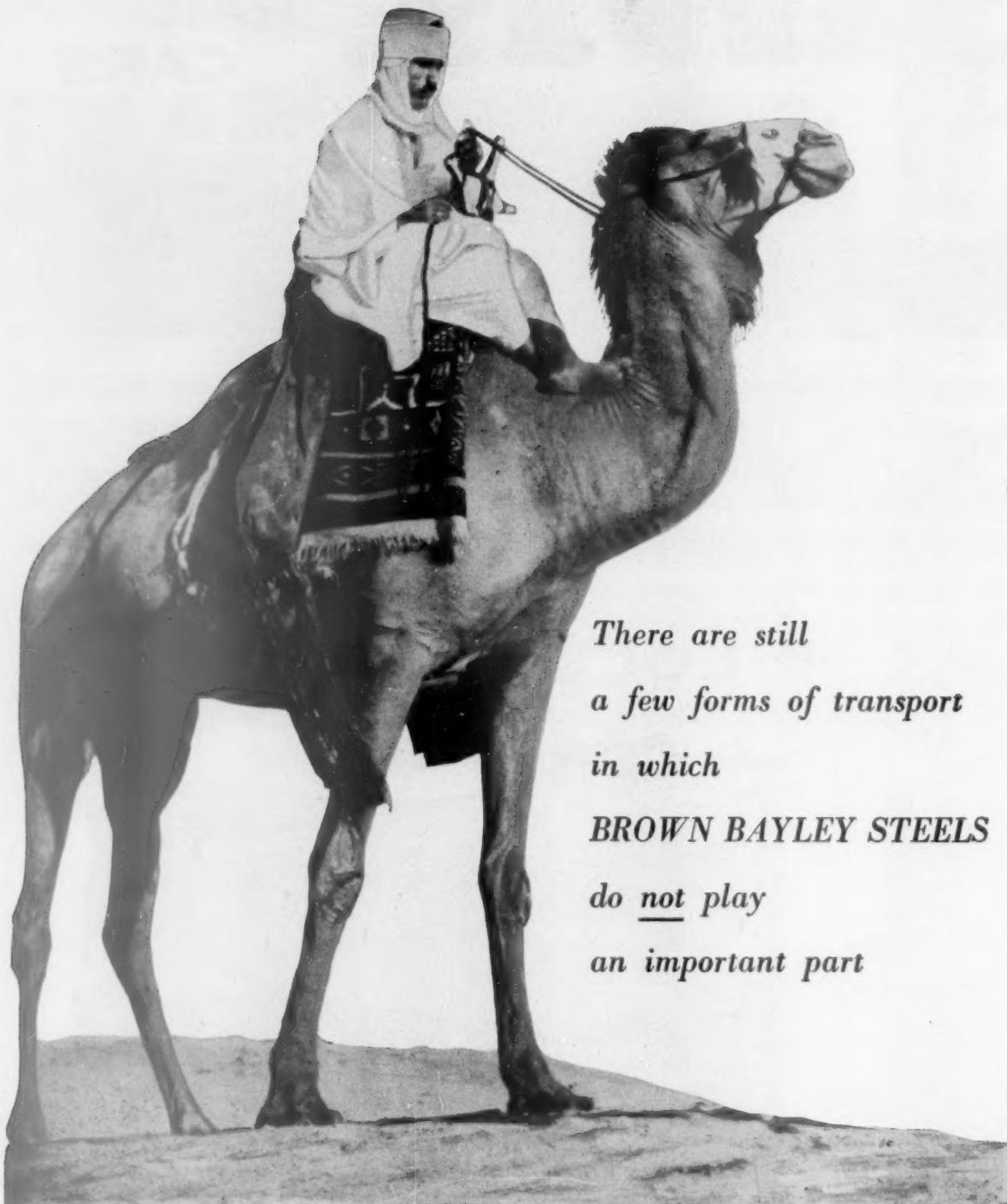
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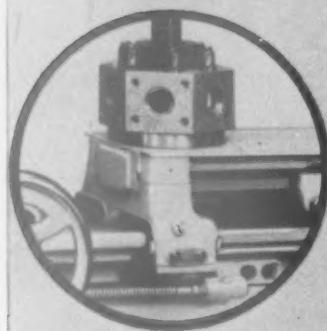
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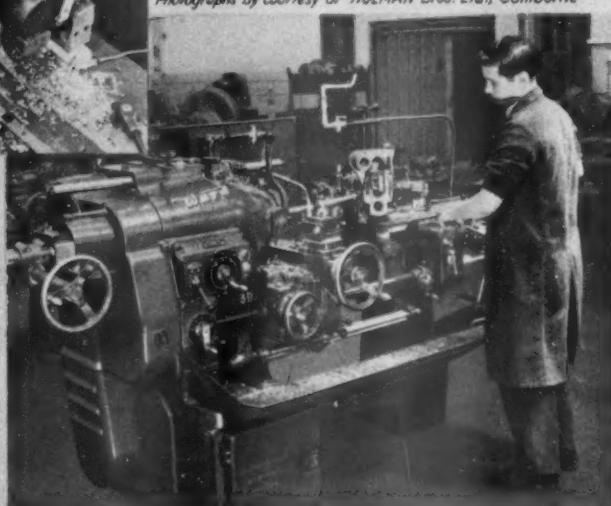


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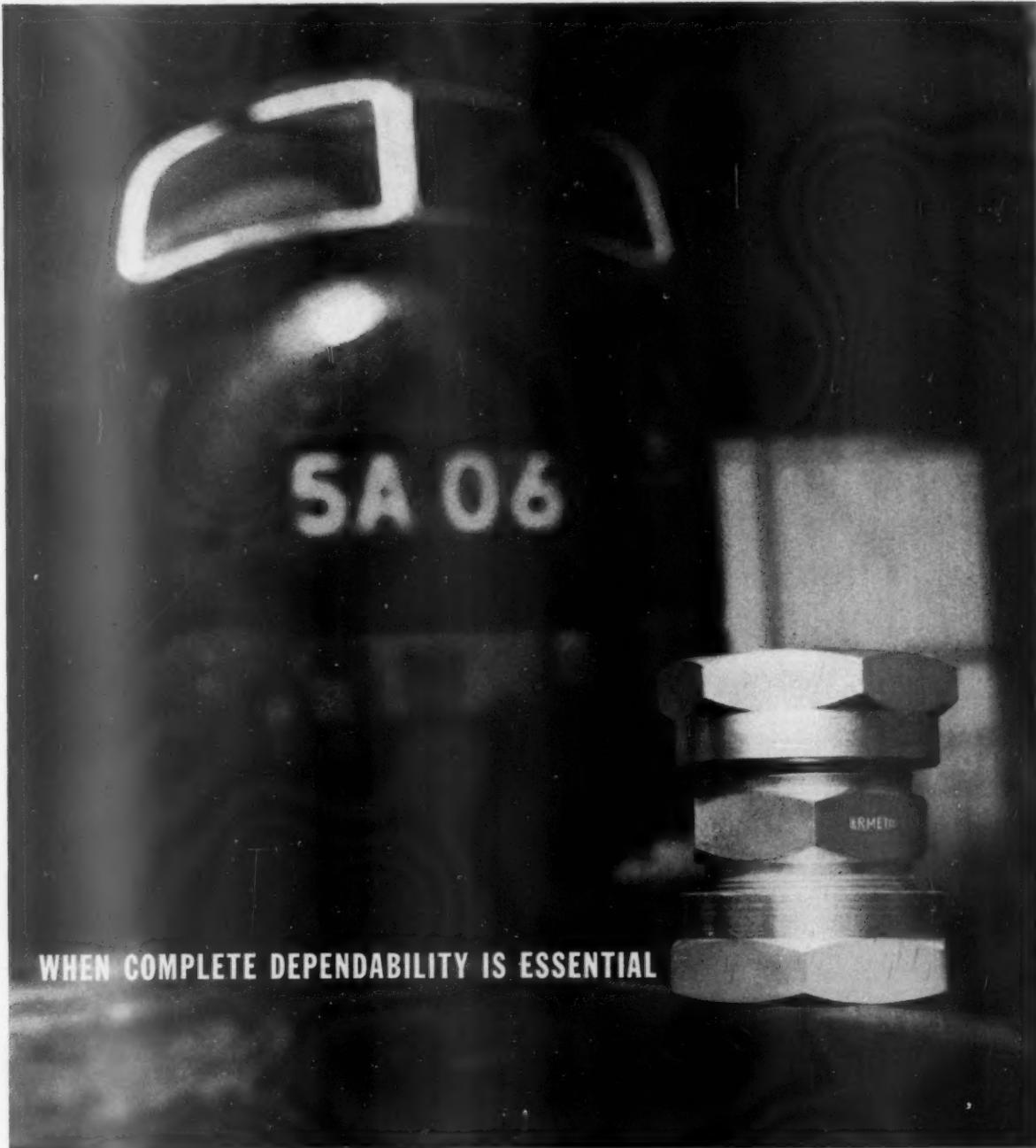
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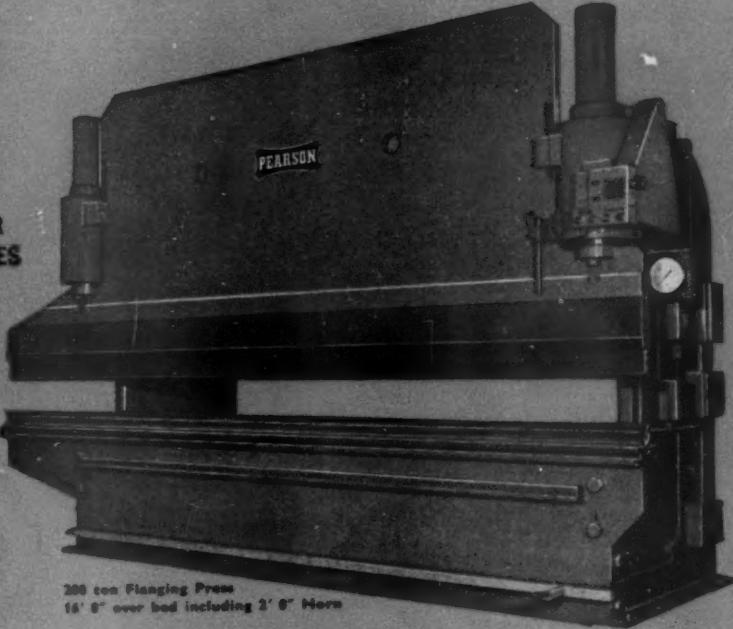
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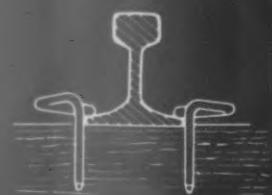
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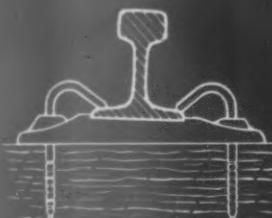
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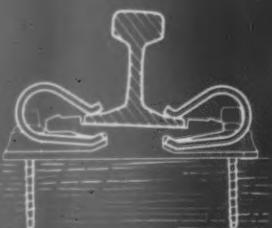
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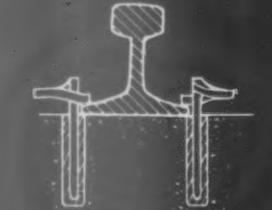
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Steel in the Common Market

It is clear that the British Iron & Steel Federation has little doubt of the benefits which should accrue to the steel industry from Great Britain entering the Common Market. Mr. C. R. Wheeler, President of the Federation, made this clear when he addressed an Iron & Steel Institute meeting in London last week. In his view, taking the field as a whole and bearing in mind that the community market is a sophisticated one well-suited to Britain's highly developed industrial pattern, there should be no doubt that the British steel-using industries would stand to gain from bigger exports to Europe. He felt that entry into Europe would generate new competitive forces which would shake up the whole economy, and in so doing release the full vigour, enterprise and determination which

could be found throughout British Industry. Mr. Wheeler emphasised that, whatever the wider change, it was essential to increase the steel industry's capacity to sell, both by improving the cost efficiency of plants and its sales machinery in all its aspects. He fully realised that the more successfully this aim was achieved, the better Britain would be able to face competition from whatever source it might come. He emphasised that an urgent reassessment of national fuel policy was required, and stressed that the reduction in the sizeable cost advantage which the British steel industry had once enjoyed against Continental producers had been, in part at least, a result of an unhappy trend in Britain's coal industry. Since the opening of the Common Market, the pithead price of British coking coal bought by the steel industry had increased nearly 60 per cent, whereas on the Continent prices had not risen by more than 16 per cent, and in some areas, such as Northern France and Holland, they had fallen. He also pointed out that the Common Market price system required the charging and publication of non-discriminatory transport rates, and this would be a matter of great importance for future rate-fixing policy in the British transport system as a whole.

Constructive Government aid for exporters?

WHEN, speaking on November 29 at the European Export Council at Eastbourne, Mr. Selwyn Lloyd, Chancellor of the Exchequer, told British businessmen in effect that they would get no help from him in easier credits, he was following a line which appears to be becoming increasingly standard with the present Government. What with exhortations to improve the transport services while spending the minimum of money in so doing; charges on the labour force to improve productivity without adding to the national wage bill, and now an insistence that business must achieve on their own what those of other, more fortunate, countries are carrying out with the backing of the fiscal policies of their own Governments, the Chancellor seems untouched by the desire to be loved for his sake alone. One of the greatest disadvantages from which the British manufacturer at present suffers is the relatively short term of credit he is able to extend to foreign buyers.

The late Mr. R. W. Foxlee

MR. R. W. FOXLEE, a former Engineer-in-Chief of the Crown Agents for the Colonies and Engineering Adviser to the Secretary of State for the Colonies, whose death is recorded in our personal pages this week, was the son of an Engineer-in-Chief of the New South Wales Government Railways and a pupil of the late Mr. Alexander Ross, then Chief Engineer of the Great Northern Railway. After service with the former Great Northern and Great Central Railways and the Port of London Authority, he joined the Crown Agents for the Colonies in 1921, becoming Engineer-in-Chief in 1949. Mr. Foxlee was also responsible for advising the Secretary of State for the Colonies on matters of policy involving public works, railways, harbours, and other subjects. He took a great interest in bridge construction and permanent way matters,

and, in 1934, he was awarded the Trevithick Premium by the Institution of Civil Engineers for his paper entitled "Hammer blow impact on railway bridges." Mr. Foxlee was a former member of the council of the Institution of Civil Engineers. He was a consulting engineer and was also consultant to Messrs. Coode & Partners, and to Messrs. Coode, Binnie & Preece.

Railway decentralisation

IN OUR news pages this week we give details of two instances where the decentralisation of railway management is being brought into effect. One instance shows the Line Traffic Manager's organisation at Manchester of the London Midland Region and the other gives details of the distribution of the functions of the London Commercial Services. The re-organisation in both cases is an attempt to bring railway management into closer contact with local developments and requirements. The fundamental reason for these decentralisations may be a good one, but in the case of the London Commercial Services, for instance, it is difficult to appreciate how greater efficiency will result from the splitting up of a single entity representing all Regions, to 13 Regional offices, excluding the Scottish and North Eastern Regions for which no provision for representation in London has been made. One disadvantage that springs to mind is that traders will have to employ staff with a knowledge of railway geography. The London Commercial Services (Passenger Travel) and Overseas Freight Service will not be affected by the change.

Dr. Beeching's message

IN A message circulated to all railwaymen in their pay packets last weekend, Dr. Richard Beeching, Chairman of the British Transport Commission, stated his belief in British Railways. The message read: "I am sure that most of you have read about the new Transport Bill and its proposals. Although it makes things better for us, some gloomy people still say that railways have not got a fighting chance. Nothing could be further from the truth, but we must get ourselves into fighting trim and then do those things which we are best able to do. A boxer in training may lose surplus flesh, but he gets stronger and quicker and more fit. We must do that too. We are learning how to fit ourselves for the future by getting a great deal of information, of a kind which the railways have never had before, by means of traffic and costing studies. When we have got the facts we shall act upon them. As I said at the Institute of Transport Anniversary Lunch: 'We mean to survive by getting out of business which is unsuitable for us and by getting more and more of that business which we can handle best—by handling it best.' In other words, we are going to get fit and fight."

Message from the General Manager

IN THE December, 1961, issue of the *Eastern Region Magazine*, Mr. H. C. Johnson, General Manager of the Eastern Region of British Railways, stated that he wrote at a difficult time for railways and railwaymen: difficult because, once again, both were in process of change and had doubts about the future. Nevertheless, these doubts must not be too greatly dwelt on; neither must railwaymen be disheartened. Changes in a rapidly changing world were inevitable and must be faced squarely. Indeed, without radical changes in the industry railwaymen could hardly hope to keep abreast of events and survive. Railwaymen must continue to concentrate on their task—the improvement of services, the drive for business and operation on an economic basis. Marked progress could be reported in many directions in 1961, including the introduction of more diesels, the further acceleration of passenger and freight services, and the commencement of electric operation on the London, Tilbury & Southend Line. These results had only

been achieved by the enthusiasm and hard work of a great many people often in difficult circumstances. Mr. Johnson concluded by thanking his staff and extending good wishes for Christmas and the New Year.

Overseas Railways 1961

THE articles contained in the 1961 issue of *Overseas Railways* show evidence of 12 months of extraordinary railway progress; in many cases, record revenues have been achieved, and not a few administrations forecast the coming of an era of self-support. The industrialisation of previously under-developed countries, the recognition increasingly being accorded to the requirements of all classes of passengers, and the modernisation and in some cases administrative reorganisation which is apparent on nearly all systems have all combined to result in new and improved business. As in the nineteenth century, the railways are opening up new territory and spreading an increasing range of products to an ever-widening purchasing power. The business is there for manufacturers of every type of product. All that is required to get it is knowledge, application, and the energy to go after it.

Low-cost automation

SPEAKING at a meeting of the Kingston Area Productivity Association on November 29, Mr. Landon Goodman, Industrial Specialist of the Electrical Development Association, said that there was a wide scope for low-cost automation in most types of industry, particularly where large numbers of manual operations were undertaken. For success to be achieved it was necessary for senior managers to be convinced of the value and applicability of automation to their companies. Short production runs, old equipment, crowded inadequate buildings, limited capital, and lack of specialist staff were disadvantages put forward by the small manufacturer as reasons for not adopting automation. One great advantage that the small industrialist possessed was flexibility. He had less rigid product designs than the large manufacturer, no costly special purpose equipment and a faster and less expensive change-over. Mr. Landon Goodman suggested that it would be of advantage to have a department of automation, representative of the trade unions, management, and the Government, to deal with the problems that automation might bring, and to speed up its introduction.

The future of the U.T.A.

THE latest statement by the Minister of Finance, Captain T. O'Neill, in the Ulster Commons shows that the Government has not yet made up its mind as to what form the future road-and-rail pattern will take, and that the extent to which the railways are to be preserved and modernised is to be the subject of a special inquiry. No indication is given as to who the independent person or persons who will carry out the expert examination of the railways might be. As this Inquiry will take some time during which the U.T.A. might be expected to incur further losses, grants of up to £2½ million are to be made available to enable the Authority to continue to run its undertaking. Another proposal is to write off £10 million of capital leaving the Authority with a capital of just under £3·3 million. It has also been resolved to extend to September 30, 1966, the date by which the Authority is obliged by statute to balance its accounts.

Drawings by wire

A COMPARATIVE newcomer to the vocabulary of communications engineering is the term "data transmission." Often this means information encoded in a form which can be fed direct into a device such as a computer store or a telemetering system, but it covers also the facsimile transmission of drawings and

documents. Photo-electric scanning converts the subject to be transmitted into electrical signals which can be sent over telephone lines or a radio link, and at the receiving end these reproduce the original by electro-chemical action on specially treated paper. Such a system has obvious advantages for any large and dispersed organisation within which it is often necessary to exchange new or amended drawings or other material. A development reported on another page is a method of scanning documents while flat instead of having to mount them on a drum, and this also enables drawings much wider than the scanning aperture to be transmitted by passing them several times through the machine. Speeds up to eight times those obtainable with drum scanners have been claimed for this Redifax Alden-facsimile process. Their use depends on the characteristics of the line circuits available, speed being governed by the range of frequencies that can be handled. The provision of wideband circuits for data transmission of all kinds is a part of current Post Office policy.

Loan for South African Railways

THE World Bank has made an \$11-million loan to the South African Railways & Harbours Administration. This loan will provide part of the foreign exchange required during the current 1960-65 expansion programme. The administration has already had World Bank loans totalling \$136·8 million to assist its earlier programmes. Other investors are participating in the loan without the bank's guarantee for a total amount of almost \$2 million, representing the first three maturities and part of the fourth maturity which fall due between December 1, 1963, and June 1, 1965. The loan is for a period of 10 years, and bears interest of 5½ per cent per annum, including the 1 per cent commission which is allocated to the bank's special reserve. The \$11 million will be used for foreign exchange requirements during the years 1961-62 and 1962-63 during which the total investment will be \$350 million. All the orders for imported equipment have already been placed on the basis of international competitive bidding.

B.E.A.M.A. directory

THE British Electrical & Allied Manufacturers' Association has published a directory which has been specifically designed to provide the members and users of the Association with a compact and convenient trade directory and buyers' guide. It is also intended to provide a stimulus to the flow of overseas trade and includes multi-lingual sections arranged for quick and easy reference by overseas buyers. In addition to French, German, Portuguese, and Spanish, a reference section in Russian has been included. Each language forms a self-contained section on distinctively coloured paper, and a cross reference system enables foreign readers to locate easily suppliers of more than 1,000 items of electrical and allied equipment listed in the classified buyers' guide section. The directory has grown out of the B.E.A.M.A. catalogue and will have a circulation of 15,000 distributed overseas. The directory may be obtained from the British Electrical & Allied Manufacturers' Association, 36, Kingsway, London, W.C.2, price £3.

World locomotive builders

DESPITE an increasing number of mergers in the locomotive industry, such as that which has brought W. G. Bagnall Limited into the English Electric group, there are still almost 200 separate works throughout the world building new locomotives of steam, diesel or electric types. Most of these works belong to industrial companies, but a proportion are those belonging to national railway systems. Additional to these works there are over 20 companies which have acted, or are willing to act, as main contractors for locomotives, though not building mechanical portions themselves. There seems to be a consensus

of opinion that today's requirements are not enough to keep all these builders going, but the great majority of the non-railway builders nowadays also make other articles. About 110 of the works are located in Europe, exclusive of the Eastern Block, and the Curtain Countries in Europe and Asia have about 35 factories.

A British export-import bank

THE recent meeting at Eastbourne of the Export Council for Europe provided the occasion for a considerable amount of constructive speaking. It is clear that much remains to be done, by industrialists, City, and the Government. Admittedly, something has already been achieved, notably in respect of the extended facilities now provided by the Export Credits Guarantee Department. It is equally certain that that is not enough.

Some practical suggestions were made, which might be helpful as far as they go. Thus, is it desirable that the interest payable on bank loans made to finance exports should rise and fall with Bank Rate? This fact alone faces would-be exporters with an element of uncertainty when they come to work out the cost of potential business. If the banks could agree on a fixed rate of interest, at a level compatible with that charged by their own banks to overseas competitors, that along would help.

Then, particularly in the field of exports of railway material, there is the question of medium-term and long-term credits, the latter running up to ten years or even more. Here again, something has been done. Instalments due on medium-term credits can now be rediscounted at the Bank of England, as and when they become payable within a period of not more than 18 months. A consortium between certain banks and insurance companies has been formed for the purpose of financing the really long-term credits granted by British exporters.

Again, so far, so good. But would the City devise a way of making promissory notes and other credit instruments rediscountable, even if they had several years to run? Is one bank-insurance consortium enough, or ought not others to be formed? The answer to these questions is not easy, but their importance is obvious. Had such systems of granting exporters long-term finance been evolved on an adequate scale ten years ago, repayments under such schemes would now be flooding in, to the great relief of the British balance of payments position.

Even these suggestions may be only nibbling at the problem. Several years have elapsed since the Locomotive & Allied Manufacturers' Association (L.A.M.A.) submitted its memorandum of evidence to the Ratcliffe Committee and, as stated above, something has since been done. Basically, that memorandum is just as true today.

To take the United States alone, there is available a list of exports of railway material financed by either the Export-Import Bank or the Development Loan Fund over the last 10 or 12 years. American exports financed in this way have spread all over the world. If Britain could have secured only part of that business, her position today would have been improved.

The L.A.M.A. memorandum also described the activities of other countries. Western Germany has its close relation between industry and the banks. France has "Coface," the counterpart of the British E.C.G.D., and thus seems to grant more generous terms than are available from Britain. There are also French devices which appear to come near to some form of subsidy. The list of foreign countries could easily be lengthened.

Rightly or wrongly, one gets this impression about one of the major differences between British and overseas exporters. In Great Britain, the exporter has to make most of the running. He has to go out and get his business first—admittedly with the help of Government representatives overseas—and then try to get the necessary finance. In contrast, such foreign institutions as the American Export-Import Bank take the initiative. In consequence, the American exporter knows in advance that

finance is available and on what terms. Equally, he may know what business is offering.

To be quite fair, British banks with their overseas affiliates and connections, do quite a lot to help. But do they go so far as to assure British manufacturers in advance that finance will be available for particular exports? Or must the British manufacturer seek the order first and then try to get his finance?

It may well be that, with their present structure and duties, neither British banks nor the City at large can do more than is being done at present. With commitments in many directions, they cannot lock up customers' funds in long-term credits, at least beyond a certain limited point.

If this is the case, then there is all the greater need for a British Export-Import Bank, operating on American lines and given sufficient working capital out of Government funds. The first duty of this bank would be to take the initiative. Working in conjunction with British Government representatives overseas, it would seek out possible business and bring it to the notice of manufacturers. At the same time, it would make it clear that finance would be available.

This last point is of the utmost importance. It would mean that, once a British manufacturer had got in touch with a potential foreign buyer, he could quote his price and close on the spot, without having to go through the lengthy routine of arranging necessary finance. He could work out his costings with greater speed and certainty, and often finish by quoting more competitive but still remunerative prices.

In a nutshell, the exporter should be able to get his finance first and secure his order afterwards. Today it is too often the other way round, to the detriment of British export trade. If it be objected that a Government-financed Export-Import Bank would be a form of export subsidy, the short answer is that other countries are doing this kind of thing already. If it be said that the Chancellor has many other claims on the public purse, then it is for him and his colleagues in the Government to assess priorities. Surely the fostering of British export trade must take high place. Apart from the consequent restoration of British economic health, an active export trade would automatically alleviate the burden of many other existing claims on the public purse.

North Eastern Region progress

DURING the past two years some 20 articles have been published in this journal dealing with a wide variety of aspects of progress on the North Eastern Region of British Railways. In particular, the objectives in the fields of modernisation and traffic development and allied subjects have been dealt with at some length. Each of these articles has been written and signed by a responsible officer of the Region.

The picture which has evolved from a study of these contributions is of close team-work and a progressive spirit running through a Region which contains the birthplace of railways. It has been made clear also that despite criticisms which are frequently made of railways by the public and the daily Press, there has been a resurgence of spirit among thinking railway men of all ranks. Under a progressive and forward-looking management, every department of the railway has been concerned to make the very most of its opportunities to bring up-to-date and, indeed, in many ways to work ahead of, existing needs, so that the overall efficiency of its services may be improved and additional traffic attracted.

Streamlining a railway system and bringing it into line with modern requirements and potentialities can never be a painless operation from the viewpoint either of the personnel who have to adapt their energies along new courses of action, and in doing so may have to abandon or modify long-standing traditional practices. Neither can it be expected that the public can always appreciate that some of the facilities that it has enjoyed for generations have become so uneconomic that they are no longer possible of continuance. Yet, if the railways are to survive and to continue to provide the basic

needs of a highly-industrialised area and nation, as they must, changes are inevitable. It is far better that they should have their source from within the industry than from without.

Elsewhere in this issue Mr. F. C. Margetts, General Manager of the North Eastern Region, contributes an article which summarises and explains much of the work which has been going on and which will continue and develop in that Region. The groundwork which has been laid gives great promise for the future. In this journal, through these articles, we have shown how much of the planning has been conducted. From now onwards we hope increasingly to deal with the fructification of the efforts which have welded the North Eastern into one of the most progressive of the Regions of British Railways.

Brazilian railways in 1961

REDE Ferroviaria Federal S.A. (R.F.F.S.A.), the holding company created in 1957 for 18 Brazilian federal railways, with a total length of 17,190·6 miles, has reported revenue and expenditure for 1960 at 12,576 and 29,497 million cruzeiros respectively, leaving a deficit of 16,930 millions to be covered by the Brazilian Treasury. Of total expenditure 62·79 per cent was absorbed by staff payments and 23·52 per cent by materials. Deficits have risen progressively since 1957 and are expected to reach 47,000 million in 1961.

Adverse balances were attributed to excessive staff payments, low traffic density on many lines, and adverse political influences.

A commission appointed to select those of R.F.F.S.A.'s uneconomic lines to be closed has recommended a total length of 4,996 kilometres, or 20 per cent of the entire system. Rede Mineira has 1,087 km. of condemned lines, Leopoldina 952, Bahia-Minas 582, V.F. Rio Grande do Sul 495, R. V. do Nordeste 372, Central Brazil 318, Leste Brasileiro 297, Bragança 293, Cearense 124, Central do Piaui 194, Ilheus Railway 128, Noroeste do Brasil 107, Sao Luiz-Teresina 43, Parana-Santa Catarina 4, but political influences will no doubt be exerted to save many of the above lines.

Federal and State Governments are investing 8,000 million cruzeiros this year in railway equipment. R.F.F.S.A. imported 81 diesel-electric locomotives during the first seven months of 1961, as against 14 in the corresponding period of 1960, and a further 80 are scheduled to arrive by December 31. The General Electric Company is supplying a total of 180 dieselelectrics, Universal type, and 7 electric locomotives at a cost of U.S. \$23,500,000; 43 U8B models of 900 h.p. are for Leopoldina and 22 for Leste Brasileiro. The remainder are U5B models of 600 h.p. for distribution to Central Brazil, R.V. Parana-Santa Catarina, Rede Mineira, Noroeste do Brasil and E.F. Goias. The seven electric locomotives are for the Central Brazil Railway.

By the end of the year three federal lines will be entirely dieselised, they are the Goias Railway, R.V. Parana-Santa Catarina, and Noroeste do Brasil, including the Campo Grande-Ponta Pora section of 187 miles. The number of diesel-electric locomotives in service on these three lines will then be 22, 98, and 87, respectively, and they will replace 44, 205, and 144 steam locomotives.

Leste Brasileiro is acquiring 31 diesel-electric locomotives and will extend this system to Monte Azul, where it joins up with the Central Brazil.

R.F.F.S.A. has ordered 23 stainless-steel, air-conditioned RDC-type railcars, from the Budd Company, of Philadelphia. Four, measuring 25·5 metres long, are for Central Brazil's 1·60 metre-gauge lines. The remainder, 18·5 metres in length, are for Leopoldina, Noroeste do Brasil, Rede Mineira, and Parana-Santa Catarina.

The Leopoldina is now awaiting delivery of 100 42-ton Brazilian-built closed freight wagons for bulk transport of sugar and cement.

An order for 426,000 tons of rails, of 37 and 57 kilos per metre, has been placed with Brazilian manufacturers. In 1960

221,000 tons, valued at U.S. \$34,319,000, were imported from Japan, 72,140 tons, Poland 59,624 tons, Belgium-Luxembourg 24,750 tons, Czechoslovakia 23,944 and Sweden 21,902 tons.

With the electrification of the 72-mile section from Mindura to Lavras, Rede Mineira has completed electrification of the entire line from Barra Mansa to the port of Angra dos Reis (301 miles).

The total length of Brazil's electrified lines now amounts to 1,325·4 miles. The Sorocabana leads the way with 307·2 miles, followed by the Paulista Railway with 298·2, Rede Mineira 301, Central Brazil 187·2, Leste Brasileiro 116·4, Santos-Jundiai 66; with the exception of five very short lines the power is in all cases 3,000 V. d.c.

Passenger progress in Japan

A COUNTRY in which there is certainly no decline in railway traffic today, and in which the trend is very much the opposite, is Japan. During 1961, a complete reconstruction of the passenger and freight services has taken place, and the results are embodied in new timetables which came into operation throughout the four main islands at the beginning of October last, adding nearly 7,000 train-miles daily to the passenger services previously in force. Expenditure in preparation for this massive increase has included some £30,355,000 on new rolling-stock (38 locomotives, 796 passenger coaches, and 6,500 wagons), and £7,150,000 on station, freight yard, and other facilities. Since the last complete timetable revision, which followed the completion of electrifying the Tokyo-Osaka main line in 1956, timetable alterations of a patchwork description only have been made, and this is therefore the first complete revision for five years.

Japanese passenger trains are divided into four categories—ordinary, semi-express, express, and limited express. The basic fares apply only to the first of these three; travel in any of the other three requires a supplementary ticket in addition to the 20 per cent travel tax, on a graduated scale, and on the limited express trains seats also must be reserved in advance. It is in the two higher express categories that the most considerable additions have been made to the service. The former timetable had seven limited express trains in each direction daily over the 345·7 miles between Tokyo and Osaka, four in 6½ hr. and the remaining three in about 7½ hr. In the new timetable their number is increased to 13, nine on the fastest 6½ hr. schedule and the remaining four in 7½ hr. Express train departures from Tokyo over the same main line have been increased from 21 to 29 daily. A few of these are relief trains, run only at times of pressure.

Similar increases, with acceleration, have been effected throughout the country. The number of limited express trains has grown from 14 to 32, of express trains from 122 to 236, and of semi-express trains from 402 to 434 daily. Ten night trains, composed entirely of sleeping cars, have been put in service, and with additional second class sleepers on existing trains the berth space has been increased by 20 per cent. To relieve the passenger trains as far as possible of baggage and parcels traffic, the number of long-distance parcels trains has gone up from 14 to 22 daily. Freight services are benefiting equally from the revision; the limited express container service between Tokyo and Osaka has been doubled, now with four trains nightly instead of two. In addition, the fast freight trains carrying full-carload freight have increased in number from 19 to 31, with two more running to a specially expedited schedule.

In the years of Dutch administration the Indonesian island of Java laid claim to some of the world's highest speeds over 3 ft. 6 in.-gauge track, with averages well exceeding 40 m.p.h. between stops and maximum speeds up to 55 m.p.h. But these figures are far exceeded by the Japanese National Railways today, which throughout are of the same gauge. Many runs on the principal main lines are timed at over 50 m.p.h. between stops, the fastest of them two, electrically-hauled, over the

149·0 miles from Numazu to Nagoya in 159 min., at 56·2 m.p.h. average, and two others from Atami to Nagoya, 162·3 miles in 173 min., at 56·3 m.p.h. The 6½ hr. runs in each direction between Tokyo and Osaka require an overall average of 53·2 m.p.h., including five intermediate stops. The last-mentioned with little doubt are also the longest non-stop runs performed in any part of the world over narrow-gauge track.

Japanese rail-speed aspirations go a great deal further than this. Such is the faith of the Japanese Government Railways in the future of rail transport that under the present Five-Year Plan a main line of 4-ft. 8½-in. gauge—the first of this gauge in the country—is under construction over the entire distance between Tokyo and Osaka, and with the help of heavy engineering work is to cut the distance to a little over 300 miles. Over this it is expected, with the help of sustained speeds in the 100 m.p.h. range and over, to halve the present fastest time between Tokyo and Osaka, with a corresponding benefit to journeys beyond that point. The year 1964, in which completion of the line is contemplated, will show whether Japan by this bold project is able to acquire the blue riband for day-to-day speed on rails.

Rhodesia Railways in 1959-60

A MARKED improvement in tonnage movement by the Rhodesia Railways system during the year to June 30, 1960, is reported by Mr. J. W. S. Pegrum, the General Manager, in his annual report. Coupled with the surcharges of 10 per cent on rates and 20 per cent on passenger fares, the railways were enabled to meet not only all working expenses but also to replenish the Rates & Wages Stabilisation Account to the extent of £1,699,887. This account now stands at £2,666,448, or £166,448 above its statutory minimum. The effect of the introduction, from July 1, 1960, of the new rating structure based on the report of the Harragin Commission has yet to be felt, and political uncertainties may have an effect on future traffics.

The Federal Treasury has agreed that all loans made by the Government to the railways shall be redeemed at 1 per cent per annum, a decision of material assistance to the railways which do not now have to make any additional sinking-fund provisions over and above 1 per cent. It has been agreed that the depreciation and loan repayment policy of the railways shall be to make full provision for depreciation of unit assets and to make a sinking-fund provision of 1 per cent of the original amount of all loans. Where the capital repayment of a loan exceeds 1 per cent of the original amount, the excess will be met from monies available in the Depreciation of Unit Assets Account. Loans outstanding total £91,497,511. Against this the capital redemption account stands at £7,520,346.

Total earnings during the year were £32,684,928, and working expenditure £26,439,963. To the balance on working account of £6,244,965 miscellaneous interest received added £528,937. Interest and expenses on loans accounted for £4,548,971, and after further sundry outgoings there was available a net amount of £1,699,887. As from December 1, 1959, Rhodesia Railways took over the running of the Bulawayo-Mahalapye section.

The following are some of the principal results:—

	1959-60	1958-59
Miles open	2,625	2,736
Gross ton-miles (thousands)	11,031,670	8,951,119
Average haul (miles)	387	372
Tonnage conveyed:		
General merchandise	4,919,087	4,782,712
Coal & coke	3,733,858	3,428,932
Minerals	3,268,532	2,745,588
Total	12,179,451	11,159,471
Total passenger journeys	4,241,396	4,643,587
Receipts:		
General merchandise	14,403,372	12,693,572
Coal & coke	3,683,524	3,054,359
Minerals	10,105,148	7,894,723
Coaching	2,174,106	2,090,785
Road motor	887,834	833,604
Total revenue	32,684,928	27,866,379
Total expenditure	26,439,963	25,758,069

The sustained recovery in traffic led to many records

being established, although there was a decline in the number of passengers of all classes carried. General goods conveyed over all sections totalled 4,919,087 tons, or 2·8 per cent above the previous year's figure of 4,782,712 tons. A record was set in the movement of copper, and asbestos railings went up 24 per cent. Total tonnage carried was 11,906,954 tons for all sections, against 11,260,080 tons in the previous year. Passengers numbered 4,241,396 by rail, and by road 298,995, representing declines of 717,123 and 50,931 respectively. Revenue per train mile increased from £1 16s. 11·4d. to £2 0s. 11·9d., or 10·9

per cent. Expenditure decreased from £1 13s. 11·2d. to £1 12s. 9·6d., a drop of 3·3 per cent.

At the end of the year there were in service 432 locomotives, 12,195 wagons, and 658 passenger coaches.

Mr. Pegrum stated that while at mid-1960 the overall financial position was a comparatively strong one, heavy expenditure was likely to become necessary on new works and additional locomotives and rolling stock, and the possibility of the railways being called on to finance the greater proportion of such outlay from their own resources.

LETTERS TO THE EDITOR

THE EDITOR IS NOT RESPONSIBLE FOR THE OPINIONS OF CORRESPONDENTS

RAILWAYS INTO ROADS

November 8

SIR.—In his letter in your issue of October 20, Brigadier Lloyd gives figures for the number of employees per road vehicle and per train for passenger and freight traffic and claims that these provide one of the basic reasons for his advocacy of the abolition of rail transport.

There are three important considerations which he omits to mention:—

1. He entirely neglects the relative carrying capacity of road vehicles and of trains. If expressed in terms of ton of freight or of single passengers, as they should be for a fair comparison, the figures would clearly be very different.
2. The figures of employees per road vehicle are based on those of the provincial and Scottish bus services of the British Transport Commission in the case of passengers and on those of British Road Services in the case of freight. They therefore omit entirely the cost of provision and maintenance of the roads used by these services and of the signalling systems and police required for traffic regulation, which are provided mainly by the taxpayer. Such a basis obviously gives a false comparison of the overall costs. To reduce the comparison to absurdity, Brigadier Lloyd would presumably claim that in the case of the cyclist the cost of employees per vehicle is zero.
3. His figures in the case of railways necessarily relate mainly to steam railways with separate manually-operated signal boxes. As he is considering the future and not the past, they should be based on electric railways with single drivers with deadman's handles and with long sections of track controlled by modern cabins with track-circuiting and route-selection facilities, which will obviously much reduce the number of employees per train.

The weakness of his contention that roadways are superior to railways for the bulk handling of passenger traffic is demonstrated very clearly by the article on page 445 of the same issue describing the proposed rapid-transit system for San Francisco, the capital cost of some £100 million for which is justified by the inadequacy of even modern motor roads to deal with the problem. In fact, the only theoretical way of increasing the capacity of a road system to approach that of a railway would be to adopt the rail practice of coupling the vehicles together into trains, controlled by the leading driver, and so eliminating the driver-reaction time of separate vehicles.

The disadvantages of small separate prime movers in each vehicle, of the exhaust fumes in the tunnel sections, and of parking in the city areas instead of at the outer railheads, would still remain.

In the days of steam railways, Brigadier Lloyd might have had some case. On lines having a traffic density which justifies electrification he cannot make a good case.

There remain the less heavily-loaded lines, where closure is gradually taking place and where it is obviously desirable to ensure that the right of way is considered for conversion to a road before it is disposed of piecemeal, when the opportunity of doing so is lost for ever.

Yours faithfully,

J. R. HARDING

38, Station Road,
Wylde Green, Warwickshire

November 11

SIR, With regard to Mr. M. J. Douglass's letter on this subject published in your issue of November 3, concerning in particular the future of the ex-Great Central line, I feel that Mr. Douglass has presented a misleading picture of certain aspects of the route.

First, he states that he spent a period of some 40 min. at Marylebone Station before catching the 8.40 a.m. to Nottingham, and in this period saw only one sign of activity, the arrival of a suburban diesel train. I think the reason for this, as far as I can ascertain, is that the day in question was a Saturday, as Table 193 of the current London Midland Region timetables shows seven arrivals on Mondays to Fridays between 8 and 9 a.m., but only four on Saturdays, and two of the latter arrive after the 8.40 to Nottingham has left, thus probably causing the mistaken impression obtained by Mr. Douglass. In the outward direction there are three departures (including the 8.40) between 8 and 9 a.m., one of which is "Saturdays excepted," while departures in the evening peak (5 to 6 p.m.) total 10 on Mondays to Fridays, against only one on Saturdays. These differences are, of course, explained by the widespread adoption of a five-day week, but certainly give no justification to your correspondent's claim that the station is so little used. Surely the fact that a station is only busy on five days of the week is no justification for closure, as it could equally well apply to countless stations in this country.

Secondly, regarding the freight traffic, the absence of this is again explained by the fact that Mr. Douglass appeared to be travelling at the week-end. It is a well-known fact that movement of freight at week-ends is usually on a very reduced scale in most areas, and it is also true that the Great Central carries a lot of freight at night as the tendency is to operate fitted traffic at night, and this class of traffic has undoubtedly increased in recent years.

If closure of part or all of the Great Central is ultimately going to occur (which I hope will not be done) I feel that there are only two sections that could possibly be dispensed with, and these are Aylesbury to Woodford Halse and Chesterfield to Sheffield. The reason for the former's continued existence would cease with the abolition of passenger services beyond Aylesbury, as most of the freight beyond Woodford is destined for the Western Region via Banbury—a line which is of immense and, I am afraid, under-exploited value. The Chesterfield to Sheffield section is covered by the Midland main line.

It is true that most of the G.C. line beyond Aylesbury has alternative routes but the G.C. is a direct link between London and the Western Region on one hand, and the important towns of Rugby, Leicester, Nottingham, Chesterfield, and Sheffield on the other, none of which can be served by one single train on the alternative routes of the Midland main lines.

I feel it is indeed time the G.C. had a fair deal. This business of classifying certain lines as "duplicate routes" could easily be carried too far—what is to stop Dr. Beeching saying, on completion of the Euston-Birmingham electrification, that the Paddington line to the Midlands is an unnecessary duplicate?

Yours faithfully,

D. G. A. PAGE

27, Gravel Hill,
Emmer Green, Reading

November 12

SIR, Those of your correspondents who so fervently recommend the conversion of all railways into roads conveniently omit to mention what must surely be the two most important considerations in any public service, *i.e.*, safety and reliability.

This refers to all winds and weathers, and I think that the thousands who scurry to the stations from cars and aeroplanes every time we get a "pea souper" or a hard frost speak for themselves.

Recent experience has shown only too clearly and too bitterly, that it is not safe to travel by road at high speeds, even in wet weather. (The motoring organisations agree with me on this point.) One dreads to think of the consequences of an M.1 pile-up in the event of all six lanes being occupied by high-speed coaches following each other at intervals of a few seconds.

The gradual introduction of track-circuiting and automatic train control on all our main lines will eventually make a train crash virtually impossible. For practical evidence of this, one only needs to look at the records of the London Underground and the Western Region over the past 50 years.

In my opinion the third most important consideration in public transport is capacity. If space in our cities is so limited, then the only answer is for traffic to go underground. If this happens, then the "capacity yardstick" becomes the number of people per hour that can be carried in unit cross-sectional area of tunnel. I think that the Bakerloo Line of London Transport is better in this respect than any road tunnel can ever hope to be. There also is the fact that it has far fewer lighting and ventilation problems. As for surface transport, there are many ways in which the capacities of our trains could be increased, e.g., by lengthening them or by introducing "double-deckers."

I would add that speed is of no value unless associated with safety.

Yours faithfully,

D. OSMAN

7, Warren Street,
Alvaston, Derby

November 18

SIR, Mr. N. D. Ball wrote inviting me to deal with the relative risk, to life and limb, before and after the conversion of British Railways into roads. It will be necessary for me to compare first the record of Britain's highways with that of British Railways for the year 1960.

Risk is measured by relating the number of casualties to the number of persons exposed. Virtually everyone uses the highways daily or, indeed, many times a day; accordingly, in 1960 some 50 million persons were exposed daily to the dangers of the highways.

In 1960 British Railways' passenger journeys numbered 1,037 million, which is an average of 2.83 million a day. The vast majority of these must have been one leg of a day-return

journey, and single journeys will have been offset by the four or more journeys often made by one person in a day; accordingly, on the average day, fewer than 1½ million different persons entered British Railways' domain as passengers. In addition there were the 515,000 railway employees, five-sevenths of whom will have been present on the average day. Allowing for a modicum of visiting and trespassing one can say that British Railways had 2 million potential victims daily, compared with the highways' 50 million—one twenty-fifth.

British Railways' fatalities in 1960 were: passengers 37; railway servants 142; others 37; trespassers 97; suicides 128; total 441. Multiplying by 25, one sees that if the highways had been equally lethal their fatalities would have been 11,025—or, disregarding the suicides, 7,825. The highways were more lenient, killing only 6,970.

British Railways' injured numbered 20,110 in 1960. If the highways had been equally dangerous their injured would have amounted to 502,750 instead of an actual 340,581.

In case the foregoing comparisons surprise Mr. Bell, I mention that they are borne out by (and, indeed, derived chiefly from) the fact that the railway industry is the third most dangerous in the country, in which respect it contrasts strongly with employment of the roads.

The comparisons show that it would be a safety measure, by a margin of approximately 10:7, to convert the railways into ordinary public highways. To convert them into motor roads, from which pedestrians and other obstructive traffic are excluded, would plainly be a safety measure by a wider margin.

I mention that the margins could also be calculable in terms of the volume of human and freight movement, but there is a shortage of data; the trunk railways would have to be matched against the trunk roads, and so on. Finally it would remain, as always, impossible to compare passenger-miles with ton-miles. The basic consideration is that the highways menace twenty-five times as many people as British Railways.

Yours faithfully,

T. I. LLOYD
(Brigadier)

24, Grove Road,
Merrow, Guildford

24-HOUR TIMESHEETS

SIR, The North Eastern, whether the appendage be Railway, Area or Region, has always been in the van of progress, so there need be no surprise that its General Manager, Mr. Margetts, has introduced the 24-hour clock at York. I hope that he will persevere and extend it to the whole region and its timetable. It will then be possible to see at a glance and without further search whether the 8.30 is in fact the 8.30 or the 20.30.

Continental railways use the 24-hour clock. Why not British Railways? You have quoted an estimate of £1,250,000 for conversion. It would be interesting to know how it has been arrived at. Has someone thought of a number, doubled it and added on a nought or two?

Success to Mr. Margetts, clarity and modernisation, and away with the Acks, the Pips, and the Emmas in the other regions.

Yours faithfully,

F. C. C. STANLEY

"Tallisford," Slade Oak Lane,
Gerrards Cross, Bucks.

INFORMATION IN TIMETABLES

November 25

SIR, It seems reasonable to expect that a passenger who pays 1s. for a British Railways Regional timetable should find in it information which is correct, at least on the day on which the timetable comes into operation. Yet this autumn not even this condition is satisfied.

In each Regional table some specimen fares are given. Those in the London Midland Region table are correct,

according to the September fare increase; those in the North Eastern Region are wrong, being those in force before September. Yet both tables came into operation on the same day!

In the L.M.R. table the passenger fares are correct, but those given for cycles, dogs, etc., are wrong, as I found out when travelling with a cycle yesterday; I argued with the booking-clerk because the fare he asked for was not in accordance with the one I had looked up in the table I had bought, and he produced a new list on a sheet of paper!

How British Railways can ever expect good relations with the public when they mismanage their business in this slack, haphazard manner I completely fail to see.

Yours faithfully,

NORMAN N. FORBES

39, Oakdale Road,
Liverpool

BRAKE-VAN BRAKE WHEELS

November 12

SIR, Each year a crop of internal injuries to railway goods guards appears to be taken as a hazard that goes with the job.

By coming into violent contact with the goods brake-van

brake wheel, broken and sprained ribs are sometimes caused, with considerable pain and suffering to the unfortunate victim. The very act of breathing may intensify the pain, and I have known a case where the man, unable to shout, simply threw out a note asking for an ambulance.

I firmly believe that the standard goods brake-van brake wheel should be scrapped and a modified type fitted to all vehicles as soon as possible.

This would consist of an inverted shallow drum of generous proportions made of metal, the rim approximately 12 in. deep, with finger-grip edges to the underside rim. An off-centre dustbin-lid type handle would give purchase. The metal to be of sufficient gauge to stand firmly on the brake column yet to buckle under heavy side pressure.

That the internal design of the standard goods-brake was designed with the co-operation of a number of staff representatives I have no doubt, but can a review be now made of this interior, bearing in mind the increased buffeting guards receive as a result of accelerated services.

Buckled brake hand-wheels can be straightened without pain.

Yours faithfully,

THOMAS WALKER

17, Dryden Road,
Balby, Doncaster

PUBLICATIONS RECEIVED

Cruising holidays. A comprehensive booklet issued by Thos. Cook & Son Ltd. This 24-page publication lists 176 ocean and Mediterranean cruises lasting from 4 to 80 days. A special feature is the section devoted to departures from Mediterranean ports which will appeal to those who wish to avoid the lengthy trip through the Bay of Biscay.

Malayan Railway Administration Calendar. A very well-produced desk calendar liberally interspersed with colour and black-and-white plates depicting scenes from Malaya. The plates are backed by explanatory texts.

Contributions to Transport. Published by the Dunlop Rubber Co. Ltd., this small booklet describes, in an easy-to-read manner, the various contributions made by Dunlop to the many forms of transport now in use. The pages are illustrated by very neat sketches.

Le Tourneau-Westinghouse calendar. The Le Tourneau-Westinghouse Company calendar for 1962 has coloured illustrations of the company's equipment above the calendar, which shows preceding and following months.

Safety & Health in Industry. The 1961 edition of this publication has been made available without cost by the Industrial Health & Safety Centre, 97, Horseferry Road, London, S.W.1. Its contents cover seven major sections, and total 150 pages, with over 100 illustrations. The book has been produced primarily as an easily-read guide on basic safety, health, and welfare in industry, and is

intended for use by foremen, works managers, and executives anxious to reduce time lost in industry through accidents. This is said to amount to 20 million man-days a year, and to be approximately seven times the time lost owing to strikes and industrial disputes.

Turners Flat Transmission Belting. A catalogue issued by Turner Brothers Asbestos Co. Ltd., Rochdale, contains a considerable amount of information relating to the use of square-and round-edge rubber belting, hammer-mill and tractor belts, balata and fire-resisting belting, and whipcord belts; all of great interest to the user of flat transmission belting. Tables give the circumference of pulleys for a given diameter, recommended pulley diameters for a given power capacity, number of plies required, and arc of contact factors. Data on design and operation of flat belt transmission are also included.

Record of the 1961 annual convention of the British Wood Preserving Association—Cambridge, July 11-14, 1961. Issued by the Association, 6, Southampton Place, London, W.C.1. The treatment of sleepers and other railway timbers on the German Federal Railways is discussed, and attention called to the growing use of beechwood sleepers treated by the Rueping empty-cell process. A simple yet reliable method of determining moisture content in sleepers is also described. Other subjects discussed are the *in situ* treatment of dry rot, X-ray analysis, wood preservation in France and Yugoslavia, and impregnation of waterlogged

pine and of eucalypt timber in Australia. There is also an outline of British Railways' sleeper policy.

The British Tram. By Frank E. Wilson. London: Percival Marshall & Co., Ltd., 19-20, Noel Street, W.1. 7½ in. x 4½ in. 87 pp. Illustrated. Price 5s. The text of this little book is a well-informed and interesting treatise on a form of rail transport which is now nearing its end in Great Britain. There are some 60 well-chosen illustrations.

Atlantic Era. The British Atlantic Locomotive. By Martin Evans. London: Percival Marshall & Co. Ltd., 19-20, Noel Street, W.1. 8½ in. x 5½ in. 94 pp. Illustrated. Price 12s. 6d.—A companion to "Pacific Steam", this volume by the same author deals with the "Atlantic Era" in Great Britain. The 4-4-2 wheel arrangement originated in the United States of America, where locomotives of this type won fame on the high-speed services of the Philadelphia & Reading Railroad between Camden and Atlantic City—hence the nickname "Atlantic". The first British Atlantic, designed by H. A. Ivatt for the Great Northern Railway, appeared in 1898 (it survives in York Museum), and the last in service, one of the London, Brighton & South Coast engines, was withdrawn 60 years later, in 1958. Other railways to use the 4-4-2 arrangement were the North Eastern, the Great Western, the Great Central, and the North British. Their examples are well described and illustrated by Mr. Evans, with some references to outstanding performances.

The Scrap Heap

Tight fit

Every morning of the working week three million workers arrive at the Tokyo suburban railway stations. Squads of porters pack the compartments "by hand," many commuters lose buttons, hats, and shoes, injuries are commonplace and windows frequently broken. The accompanying illustration shows a packing squad in action.

Steam-driven

An engine handed over to the Hampshire Narrow Railway Preservation Society was taken recently by steam lorry from a refinery at Fawley to Bishopstoke, near Eastleigh. It is being kept there until the society builds its railway.

50 years ago

Employees of the Lake Erie & Western Railroad have been forbidden all intoxicating liquors, whether on or off duty. From "The Railway Gazette" of December 1, 1911.

Hire purchase and railways

Contrary to widespread belief, hire purchase was not an American innovation. In fact, it was a development in the British railway rolling-stock industry 100 years ago, as is shown in a recent brochure issued by the Finance Houses Association. The early finance houses came into being to buy railway wagons from the builders and hire them (with an option to purchase) to railway companies, collieries, and quarries. Colliery owners unable to meet the capital cost of a large stock of mineral wagons were the principal early customers. The



Passenger packing during Tokyo rush hour

North Central Wagon Company of Rotherham, formed in 1861 and now an active centenarian, was probably the first. Several other large finance houses still retain the word "wagon" in their titles, indicating their origin.

Stamp duty

One would hardly expect to hear someone ask at a stationmaster's office for two threepenny stamps, a day return to Dingwall, and a premium bond. It could

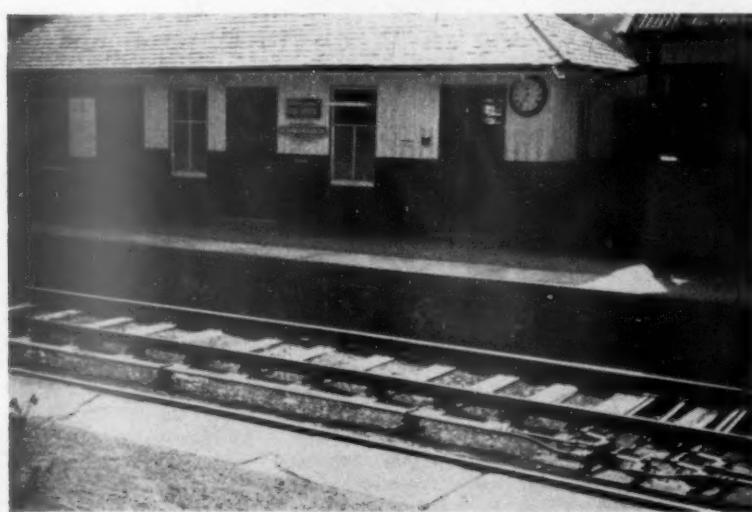
happen at Achnashellach in the West Highlands of Scotland, where the Post Office and the stationmaster's office are combined.

Footplate fashions

The driver and fireman of "The Caledonian," the London-Glasgow express, were presented with expensive suit lengths recently when the train made a special stop at Lockerbie, Dumfriesshire. The stop was made for a party of wool merchants and tailors from London, who are attending a conference at the Lockerbie mill where the suiting is made. The party returned to London on November 30, in special accommodation on "The Caledonian" which again made the additional stop at Lockerbie to pick them up.

Anna Jay Gould

A link with the gay '90's in Paris and the earlier ruthless era of American railway "empire" expansion was broken by the death at the end of November at the American Hospital in Paris of Anna, Duchess of Talleyrand. She was formerly Anna Jay Gould, daughter of the American railway magnate Jay Gould, whose spectacular business career from 1867 to 1892 was often denounced as piracy and undoubtedly left an indelible mark on American economic life. He left a fortune of more than \$70 million, which enabled his daughter to become a fabulous hostess in Paris.



Post and stationmaster's office at Achnashellach

OVERSEAS RAILWAY AFFAIRS

FROM OUR CORRESPONDENTS

SWEDEN

New class of diesel-electric locomotive

In October, the first of a new class of diesel-electric locomotive was delivered by Nydqvist & Holm AB. to the Swedish State Railways. An order for 25 locomotives was placed in 1959 and, in view of the excellent performance of this type, it was increased to 50 in 1960. The engine is a 12-cylinder, two stroke General Motors diesel of vee type, developing 1,425 h.p. Designated 567-D1, it is a development of the 567-C. model. Allmanna Svenska Elektriska AB. (A.S.E.A.) manufactured the LJD-138 main generators and the LJB-76 traction motors under licence from General Motors.

PORTUGUESE EAST AFRICA

Extended quays at Lourenco Marques

Mozambique State Railways has announced that it intends to extend the Lourenço Marques quays during the next two years by some 300 metres. This, combined with the proposed ore-loading wharf, should help to prevent congestion when the Swaziland Railway comes into operation.

SOUTH VIET NAM

Construction of railway link

Work will commence soon on a 3-km. spur line to link the Thu Duc industrial development area with the main Saigon-Hue railway line. The cost of the line will be £21,000.

VICTORIA

Allocation of funds

Victorian State Railways has been allotted £A7,650,000 from the Commonwealth loan allocation, most of which will be used on standard-gauge works. A further breakdown of funds allotted shows £A.920,000 for the Spencer Street passenger terminal. £A.1.5 million on a locomotive depot and goods terminal at Dynon Road. £A.140,000 for the North Melbourne fly-over, and £A.216,000 for grade separations between Melbourne and Albury. Victoria's share of the cost of two new sleeping trains for the overnight Melbourne-Sydney service will be £A.382,000. A further £A.145,000 is to be used for converting 25 carriages and vans to standard gauge for the same service. Construction or rebuilding of



Diesel-electric locomotive for Swedish State Railways

standard-gauge goods wagons will absorb a further £A.600,000. Other expenditure will be on five Harris suburban trains (£A.1.1 million); 80 bogie brake vans for goods trains within Victoria (£A.300,000), and preliminary plans for the Melbourne Underground (£A.35,000).

concrete sleepers. The rails will still be held fast by spikes or clamps as at present, but it is hoped to replace with glue the tie-plates and other devices now used as buffers between track and sleepers.

In Brief

Czechoslovakia. The Czechoslovak State railways has adopted the Giesl ejector for 1,000 locomotives of seven types, following a report that the savings in coal would cover the cost of the ejectors in one year.

East Africa. East African Railways & Harbours is proposing to equip 12 of its "57" class Beyer Garratt locomotives with Giesl ejectors.

Greece. Hellenic State Railways has ordered seven diesel locomotives from the West German company, Fried. Krupp AG.

Nyasaland. A net operating surplus of £110,381 is reported by Nyasaland Railways Limited for 1960. This is 9.6 per cent below 1959.

United States. A high-speed electronic weighing device which prints out in less than three seconds the weights of wagons as they move through a yard, has completed field trials.

UNITED STATES

Bonding rails to sleepers

The Chicago Research Centre of the Association of American Railroads is experimenting with a high-strength epoxy-resin glue for bonding steel rails to

RAILWAY DEVELOPMENT in the North East

OVER a period of 24 months, through a series of 20 articles, Officers of the North Eastern Region have described the aims and progress in the fields of modernisation and traffic development. Equally important related subjects such as staff relations, public relations, estate development and stores control have also been presented. During this period evidence of progress and change in the realms of fixed installations, motive power, and passenger and freight carrying vehicles has become increasingly obvious. Stemming from this progress there has been a steady improvement in services offered.

Faster services

The "Trans-Pennine" inter-city diesel multiple-unit service between Hull, Leeds, Manchester, and Liverpool, the accelerated Newcastle-Merseyside expresses worked by 2,000-h.p. diesel locomotives, the first of the "Deltic"-worked trains to London, slashing the journey time from Leeds and Newcastle to London by 45 min. and 59 min. respectively, the extension of "assured" freight services, the popularity and expansion of the export express service, the undoubted improvement in punctuality—these and other developments in varying degrees portray the emerging pattern and changing face of a reinvigorated rail system.

Increasingly there is also becoming evident a resurgence of spirit among the thinking railwaymen of all ranks who know that, while the harsh criticism of years, the lack of understanding of our problems, and the shortness of public memory as to the part the railway and its staff played in the war may have blurred the image and clouded the great tradition of railways in the North East, the streamlined revitalised system which they are building and the steadily-improving service which they are offering will demonstrate clearly that there is a place for the railway in the future.

Streamlined system

But the size and shape of the railway is not going to be the same. During the two years which have elapsed since *The Railway Gazette* commenced its review of progress in the North East, there has been further contraction. The present position is that 190 stations have been closed completely, 237 stations have been closed to passenger traffic, and 266 miles of railway have been, or are expected to be, shut down. Among them are such interesting lines as the Keighley-Oxenhope branch serving the Brontë

Far from weakening the network, streamlining is expected to strengthen the railway and consolidate demand

by F. C. MARGETTS, M.B.E., General Manager, North Eastern Region, British Railways

country, and the Barnard Castle-Kirkby Stephen link over the Pennines. Such closures are inevitable. More must follow. They are not signs of decay. The system must be brought into a proper relationship to changing demand.

Pruning, if properly performed, leads to greater strength and improving fruitfulness, as any gardener knows. We must prune by cutting out the weakened branches which sap the strength of the whole. We must disbud by closing unnecessary stations. We must control the "laterals" and husband strength for the main stems. And when we have done all this we must discriminate in selection of traffics and not just take on everything regardless of capacity, cost, and effect on the whole.

Constant criticism

At this point it may be pertinent to comment that transport undertakings seem to attract unending and often irreconcilable criticism, and none more than the railways. Most proposals to close unremunerative lines and stations inevitably seem to arouse the fiercest opposition. Often this opposition is based on the theory that we have social obligations to fulfil. At the same time we are criticised because of the state of our finances. There seems to be little recognition that the maintenance of a framework and provision of a service on a scale which is no longer appropriate to the times certainly does not help the finances. Improvements, better amenities, cheaper rates, and reduced fares are expected and demanded all the time, and economies which might in the long run make such improvements possible are opposed.

But inevitably contraction will take place and, where the railway system does remain, there will be an equally critical survey of the services. Excursions to the seaside—football specials—trips to the Races—Bank Holiday rushes, traditionally the railway has been expected to provide for the lot, and at the cheapest possible rate. In the future a great deal more thought is going to be given to the economic aspect of all these facilities, and where they do not make their



proper contribution, then they cannot be expected to survive.

Doubtless, the usual exhortations to reduce fares will be heard again and again but, in the North East at least, it is not intended to listen to this siren's call. Indeed on what grounds can it be argued that rail travel should be cheapened? *The Railway Gazette*, dealing with fares increases on June 23 this year, produced a table which clearly showed that the average receipts per passenger-mile were extremely low in relation to the cost of living index and expressed the view that it was difficult to understand why the railways alone should arouse such public opposition when they endeavour to bring their prices in line with their costs. This is entirely in line with our thinking in the North East, which is that the value given for money makes our fares cheap.

Good value in fares

What does not seem to be appreciated is that most fares are cheap when looked at against the background of rising prices elsewhere, against costs, and against the value given. In the North East in particular, the change over of local and cross-country services from steam to

diesel multiple unit, the increase in frequency, the improving punctuality and greater cleanliness, the faster overall timings—all these which have taken place in the last few years—are reflections of service which is value for money, but it seems to be an imbued trait to regard any payment for a service in a different category from payment for, shall we say, consumer goods. It is time it was recognised that rail travel is cheap in the sense that the combination of a contribution from a body of railwaymen to whom the giving of service is still a tradition, the progress in the field of modernised services, the operation of a timetable which applies under all conditions, and—a point which is often forgotten—has a safety level second to none, represents real value.

Ever-available services

It is not only in the field of passenger service that the railway is looked on to provide an inexhaustible and "on demand" service regardless of cost. Is it not true that traditionally many trades and industries have come to look on the railway as an ever present and inexhaustible reservoir, whose resources can be drawn on as by turning a tap? The vehicle of movement, the railway wagon, is looked on as something which the railway must provide anywhere, any time and in any number, so as to ensure that plans of the user are at all times met, irrespective of anything else. Coal and steel, potatoes and sugar beet, timber and wool, fertiliser and chemicals: all these and others call for a railway service despite the existence and employment of formidable competitors.

The railway the prime mover

In many cases the railway is the prime mover, it takes the base load, it is expected to rush in and cope with peaks whether they be daily, weekly, seasonal, or even spread over a period of years. These peaks are in some cases unavoidable and some can be related to the economic position of the country. But they all cause demands on a railway service and rule the provision of motive power and men, enhance empty wagon movement, increase shunting costs, affect line capacity, create recording and documentary work, and at times lead to the holding of assets to the value of millions, even though there may be no work to do. All this is taken for granted. It is regarded as being inevitable. There are those who consider it a duty or an obligation which the railways should always meet, and few regard it as something for which they should pay extra. One looks in vain to see road competitors supplying thousands of lorries to be immobilised for indefinite periods—building thousands to meet seasonal demands—running excessive empty mileage and using manpower to supply mobile warehouses—keeping the road clear in adverse

climatic conditions by their own efforts and at their own cost. It is high time that we had some realistic thinking in these fields if we are interested in the survival of railways.

Surely it is commonly accepted that there is an imperative need for railways! They provide an ever-present, also universal, form of transport for both passengers and freight which is always available. There does not seem to be a recognition that the whole nation, either directly or indirectly, relies on there being a transport service which will carry both people and goods at any hour of the day or night and link all parts of the country together. It is true indeed to say that if we did not have the railways, then they would have to be invented.

Somewhere along the line it is not unusual to meet charges of inadequate management. Income deficiencies are linked with inefficiency and attempts to streamline and economise are regarded as indicative of lack of imagination and an inclination to take the easiest course. The consequence is that there is little realisation of what a good job railway management is actually doing.

Inviting public criticism

To some extent it was with this in mind that, 18 months ago, the North Eastern Region launched its open forums in big towns and cities. They were a success. The attendances and the questioning proved that there is still a great interest in the railways, that there is a wish to see them survive and prosper. Then there is the Press—technical, local and regional. We owe much to this body. We have recognised that it is our responsibility to tell the Press what we think, what we are doing, why we are doing it, and what our hopes are for the future. This is being done to an increasing extent and

it is not surprising to find that representatives of the British Press are very often railway enthusiasts. We like to feel that the efforts made to improve public background knowledge as to what the railway is doing have led to better informed and more sympathetic talking, thinking and writing about them. The efforts will continue. The fields of contact will be expanded. There is nothing to hide or to be ashamed of in our conception of the place for a railway in the North East. Albeit, we do not expect, when we deserve it, to avoid criticism.

Staff relations

It would not be unreasonable to claim that a field in which there has been a marked awareness of need is that of staff relations. There has been a growing recognition that, in the light of present-day requirements and developments, railway administrative policies cannot be based on an incomplete view of our staff. It is more than ever necessary to consider the potential of staff for development, their motivation, and how they will adjust themselves to the changing conditions. This cannot be done simply by good relations. There is more to it than that.

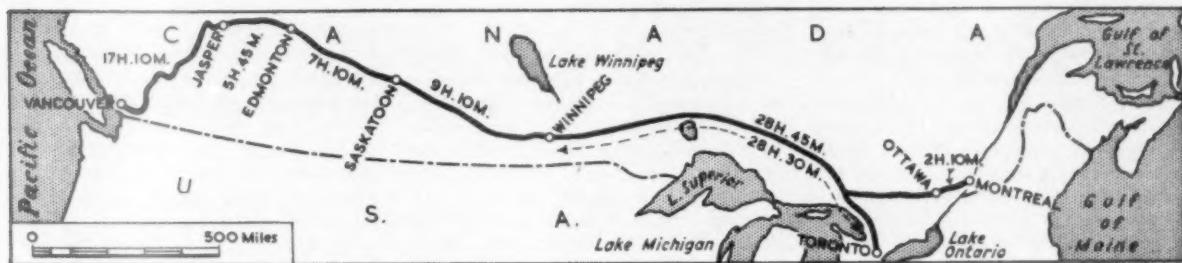
There must be sound understanding instruction at all levels based on a clear knowledge of requirements. Example must be set and it must be known and seen to be good. Only by such means can morale be raised. Recognising its capacity limitation, and the value of independent thinking, the Region has had no hesitation to enlist the help of outside consultants. Some of the courses of action have already hit the headlines. There is confidence that the results will do the same.

This is the last of the current series of articles and it might be of interest to

Concluded on page 657



North Eastern Region open forum at Newcastle-upon-Tyne



Map showing route of trans-continental freight train

FAST TRANS-CONTINENTAL freight trains

IN AN effort to regain some of its lost freight business, Canadian National Railways has placed a fast trans-Continental freight train from east to west and another from west to east, leaving daily from the Atlantic and Pacific coast cities of Halifax N.S. and Vancouver B.C. The scheduled runs of these trains, named "Highballers," are 3,764.2 miles long and are completed on the morning of the fifth day.

The scheduled runs are strictly on fast passenger express train schedule. The same diesel-electric locomotives make the complete coast-to-coast run, the only servicing on the run being for fuel oil, water, and sand.

At each of their scheduled stops, the sections or wagons to be picked up or dropped off are planned in advance so the only work necessary is to uncouple

Transit time of under five days operated to express train schedules by C.N.R.

the raft of wagons for that stop and couple up the new raft which is going further west.

The fast service was made possible by improvements in main-line roadbeds, for heavier and faster trains, plus the installation of centralised traffic control, their fast runs have eliminated the former siding stops to allow fast passenger trains to go through, for they operate on the same fast schedule.

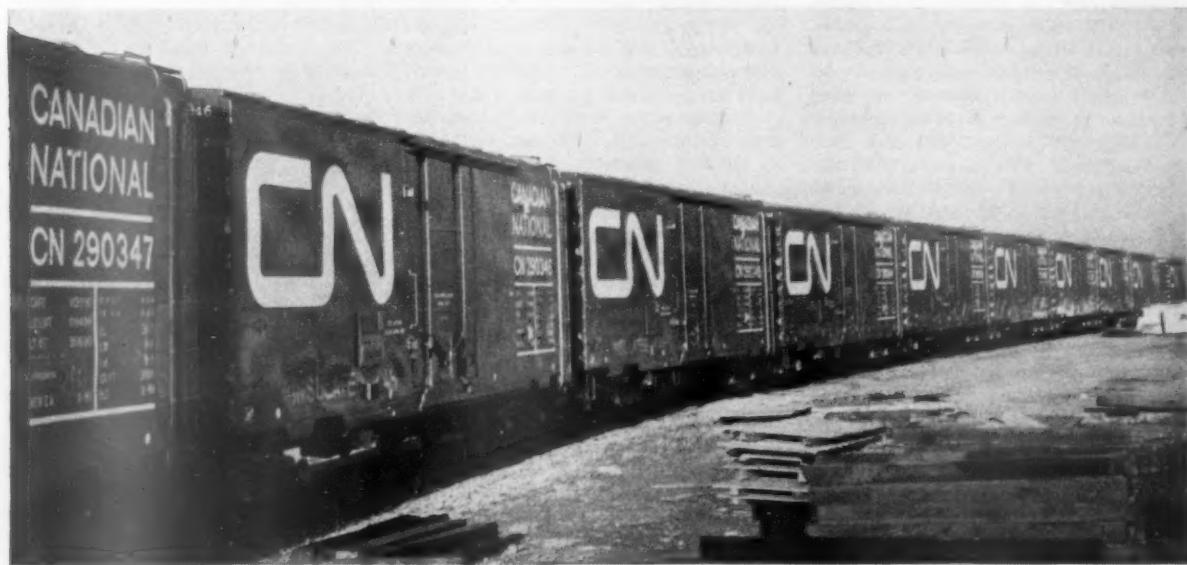
Each train is pulled by a standard high-speed heavy-duty diesel-electric unit, comprising three locomotives. The engines will pull a fully-loaded train of 100 wagons at a sustained speed of 80 m.p.h.

Two more diesel-electric locomotives are added as booster power for climbing the mountains encountered in the west, and as additional braking power when descending on the opposite side.

The booster power is dropped off at the foot of the mountain grade, where it awaits the arrival of the train from the opposite direction. The booster units never leave the mountain area.

From Halifax to the Pacific coast, the schedule is 96 hr., or an average speed of approximately 40 m.p.h. for the entire 3,764.2-mile run.

Since its inaugural run from Halifax on January 9 the "Highballer" has



Freight wagons bearing the new insignia of Canadian National Railways

carried an average of 100 loads daily. Average punctuality percentages have been: Montreal, 85; Winnipeg, 86; and Vancouver, 80—ahead of time!

The "Highballer" came into being as the result of teamwork among Canadian National operating and sales departments and labour organisation. Studies had shown that the railways were losing ground as it met steadily increasing competition in the transcontinental freight-hauling field.

Lines in the United States were speeding up schedules, consignors were ambitious for a bigger share of the market and, in planning the fast freight scheduled service, Canadian National was not only protecting its traffic, but developing an

attractive deal to offer prospective customers.

The path to successful operation of "Highballer" was not smooth. The most difficult aspect was to induce the railway unions to change old operating methods by permitting longer, faster freight trains operating over longer distances within the same time period between crew changes. Even with the event of the diesel-electric locomotives the unions insisted on crew changes according to the old steam locomotive scheduled stops for servicing. An agreement was finally achieved on the new running schedule.

Capital improvements such as complete dieselisation, C.T.C., longer passing tracks, end-to-end and wayside train

radio, and improved track are now showing results.

On the layout of the new freight train schedules, because of higher speeds and less frequent stops, freight trains are now synchronised with the running time of the fastest passenger trains, thus eliminating passing stops. The express passenger trains never overtake the "Highballers."

Already the "Highballer" has developed new business for the Canadian National Railways, and the operating and sales forces are examining the possibility of operating with connecting trains to provide it with additional traffic, which may require the addition of more sections to the train.

DISPOSAL OF FLOODWATER from railway land

THOUGH the railway engineer is primarily responsible for the construction or maintenance of railway property, it is surprising how often he has to supervise works which are not the direct concern of the railway but indirectly the liability of its management.

One instance lately brought to notice was of the disposal of surface floodwater beyond the confines of railway land. The problem appears to have been solved economically, and as there may at any time be more or less similar situations elsewhere, the solution is briefly described below.

The site described

To the south of Denham Golf Club halt the Western Region—and former Great Western & Great Central Joint-line—is carried on an embankment half way up a hillside sloping transversely to the railway. As the embankment was liable to impound water gravitating down the hillside an adequate culvert had been constructed to pass it under the line. However, the railway was under an obligation to provide drainage for this surface water beyond and below the culvert, and it was duly discharged into a pond. The pond was expected to act as a soakaway and generally did so, but after heavy rain the pond overflowed, flooding an adjacent highway. An easement was therefore obtained to run a pipe to another pond at a lower level, and also a ditch and pipe onwards to ensure that all surface drainage discharged into the River Misbourne.

In 1957 the land on which the overflow pipe ran was developed, and as the easement had previously been terminated by the grantor, the developing land-owners refused to accept the drainage

An economical method of bore-hole drainage gives a saving of 90 per cent over piping away water

overflow. At first it was thought that the water would have to be piped all the way to the river at a cost of about £3,000.

Alternative method of water disposal

A study of the geology of the area revealed deep layers of chalk under gravel surface beds, and it was decided to try boring vertically from a point below the edge of the pond down to and into the chalk and to rely on fissures and its natural permeability to absorb the overflow water. It was realised that if this arrangement was to function satisfactorily and continuously, floating debris must not be allowed to be carried from the pond into the bore.

Accordingly, a standard precast concrete catchpit 2 ft. deep was built with its top 2 ft. below the overflow level of the pond. A 9-in. G.S.W. pipe was then laid with a downward slope to connect the catchpit with the lower part of the pond. This pipe could then draw off the top 4 ft. of water from the pond into the catchpit, not from the pond surface but from a level below the bottom of the catchpit. Being drawn from this low level up the slope of the pipe the outflow would not carry debris.

Results of vertical bore

Of the three concrete units normally forming the bottom of the catchpit, only the two outer ones were fitted, leaving the central space between them free for boring. This took the form of a 6-in. bore put down with a percussion well-

boring rig. The bore had a steel lining carried down through the gravel and the upper layers of soft chalk. Chalk was first reached at 10 ft., ground water level at 28 ft. and the bore was stopped at 60 ft. Water could thus seep away throughout the lower 21 ft. of the bore.

This system has not yet proved its efficacy under natural conditions of flooding, but when 2,400 gal. of water an hour were pumped into the bore-hole for 3 hr., ground water level rose by only 2 ft. The total cost of this system proved to be under £300 or only 10 per cent that of a pipe to the river.

This article is based on information supplied by Mr. M. G. R. Smith, Chief Civil Engineer, Western Region, British Railways.

SWISS FEDERAL RAILWAYS IN SEPTEMBER

During September, the Swiss Federal Railways carried 19 million passengers, 200,000 more than in the same period last year. Receipts from passenger traffic rose by Sw. frs. 3·9 million to Sw. frs. 39·1 million. Goods traffic handled during the month rose by 130,000 tons from September, 1960, to reach 2·79 million tons. Receipts rose by Sw. frs. 2·3 million to Sw. frs. 55·3 million. Total receipts were up by Sw. frs. 6·4 million against September, 1960, to 101·9 million. Expenses also rose by Sw. frs. 3·9 million and profits were Sw. frs. 33·3 million. The corresponding figure for last year was Sw. frs. 30·9 million.

LENGTHENING PLATFORMS at Blackfriars Station, L.T.E.

SOME of the difficulties of making alterations to an existing sub-surface Underground railway station are being demonstrated at Blackfriars, on London Transport's District Line, where the platforms are being lengthened by 74 ft. so that passengers will no longer have to use the narrow "catwalks" at the ends of the platforms. This task includes the demolition of the existing running tunnel and the construction of a wider covered way for the platform extensions. It also involves the bridging of the Fleet—many years ago reduced from the status of a navigable tidal waterway to a sewer, but still carrying a considerable volume of water—and the replacement section by section, at night when road traffic is at its lightest, of the roadway at the junction of Blackfriars Bridge and Queen Victoria Street—one of London's busiest road junctions. All this is being done by working under temporary decking from a site on the surface only 20 yd. square.

Foundation problems

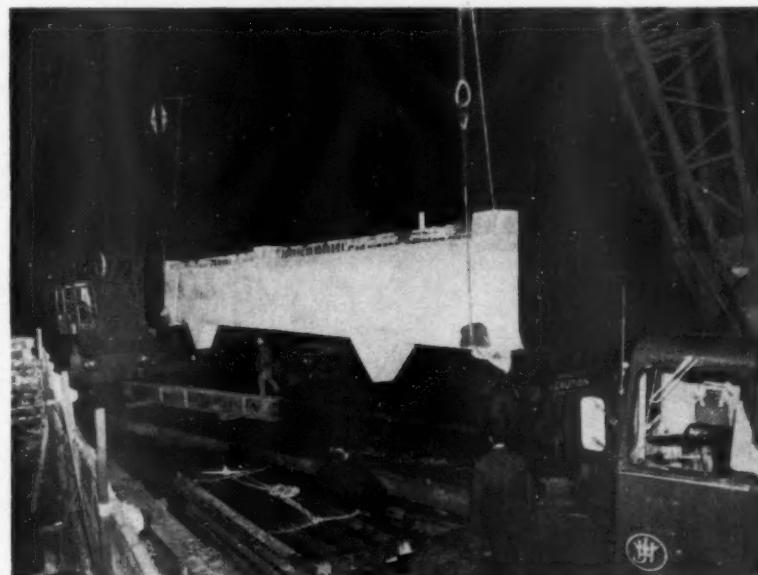
The soil along the Thames Embankment is very largely made-up ground and mud. When the line was built in the late 1860's, as much as 24 ft. of ruins of former buildings and débris going back perhaps 2,000 years had to be cut through in places and at Blackfriars the original foundations had to be carried down to 13 ft. below rail level.* The general construction of the original

*During the original building work the chalk-rubble foundations of an old fort were uncovered at the mouth of the Fleet and during the present work a large number of cattle horns has been found.



Beam being lowered over fixing bolts on top of column

Complex task in confined space includes bridging the Fleet river, for long in use as a sewer



Precast beam being lowered into position by two mobile cranes

covered way for the line along this stretch consists of brick walls and an arch with a concrete invert. The covered way is wider at the station with girders to support buildings. The Southern Region railway and station are carried over the Underground station on a large viaduct.

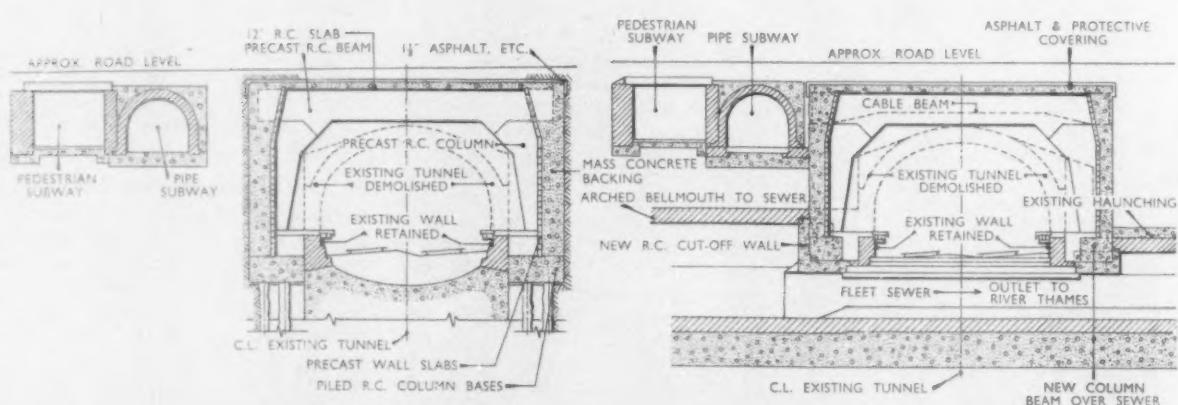
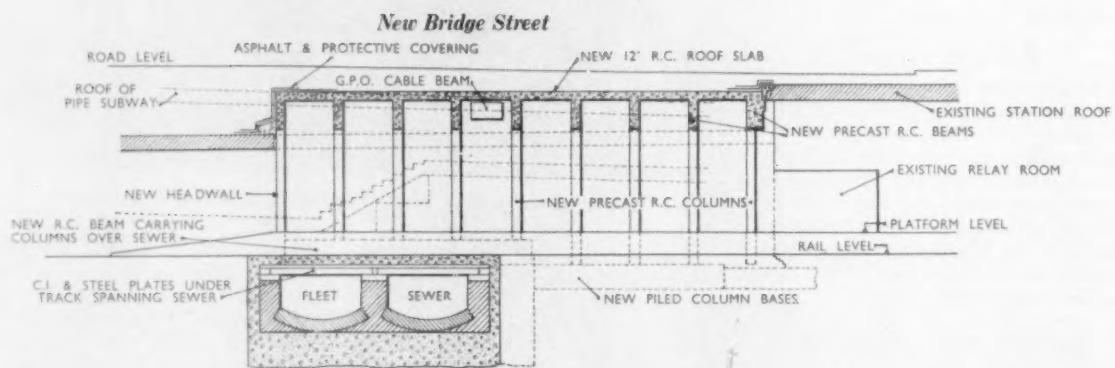
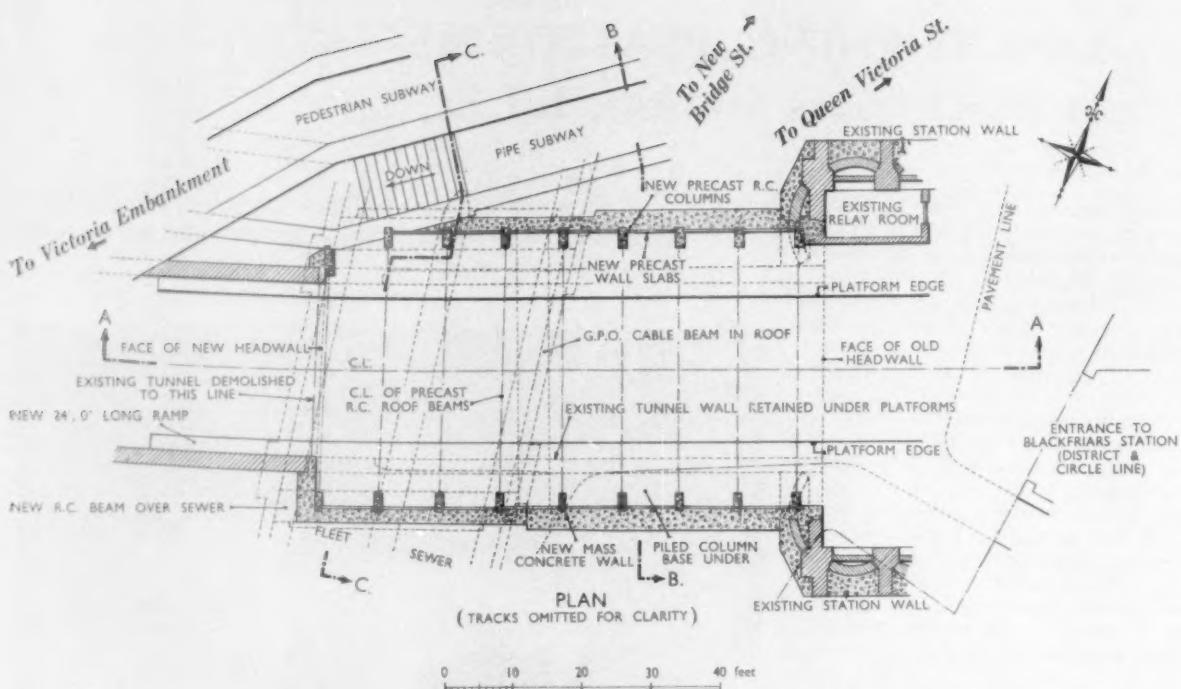
The platform extension work was begun with the diversion of a large route of trunk telephone cables and other G.P.O. equipment. This was followed by the excavation of trenches 30 ft. deep x 8 ft. wide on the outside of the existing tunnel walls from headings below the temporary street decking and the sinking of bored piles a further 60 ft. from the bottom of the trenches to support reinforced concrete bases for the new structure. The clay line at this point is at 29 ft. (Newlyn Ordnance datum), or about 32 ft. below rail level. On these bases, 18 seven-ton tapered precast concrete columns, nine on each side, are being erected to support new roof beams. The columns are slotted at the sides to take precast wall slabs and the space behind the slabs is being filled by a mass concrete backing.

The tops of the columns have an angular profile which mates with precast

reinforced concrete beams, each weighing 19 tons, which support the roadway above and form the roof of the extended station below. The beams are being lowered in position at night after a section of the roadway above has been removed. This is an operation requiring two cranes and must be carried out with precision and with careful timing as the roadway above must be reinstated temporarily so that the heavy morning traffic is not obstructed. The placing of one beam is a whole night's work. The beams will eventually be covered by a 12-in. reinforced concrete slab which will form the support for the roadway.

Spanning the Fleet sewer

About half of the new platform extension lies above the Fleet sewer, the sewer being taken under the line in two brick channels with flat cast-iron tops. On the north side there is an arched bellmouth to the sewer and on the south side it runs to an outlet into the River Thames. Over the length of the sewer, the vertical columns are carried on two reinforced concrete beams spanning both sewer channels, with new reinforced concrete cut-off walls to close off the exposed



Lengthening of platforms at London Transport Blackfriars Station, District Line

upper sections of the sewer tunnels, which are of a larger section than the two brick channels which run below the tracks.

The Fleet, only one of the London brooks and rivers which caused difficulties in the building of London's Underground railways, gave considerable concern when the railway was originally built. It had to be diverted and re-diverted many times and for a period had to be carried beneath the railway by a siphon—no mean feat with a river carrying such a volume of water. Although the present work has not required such extreme measures, the Fleet River must still be treated with respect.

Obstacle presented by pipe subway

A further complication is the presence of a large pipe subway running very near, and at a slight angle to, the new walls. The pipe subway encroaches on the space required for the columns at the extreme west end on the north side, so that the westernmost column has had to be mounted out of line with the other eight columns on that side. The pipe subway falls at this point to pass under a pedestrian subway which, after running parallel to it for some distance, turns over it and the railway to give access to the Victoria Embankment. All this work has been done without interruption to the train service or to road traffic above.



Interior view of completed bay showing roof slab above

When the new work has been completed, the existing tunnel, which will then lie inside the new station section, will be demolished except for the lower sections of the brick walls. These will be levelled and left *in situ* to form the base of the new platform extensions.

The whole of the work, which is costing £140,000, is expected to be com-

pleted by an early date in the New Year.

The work was designed and is supervised by the Executive's New Works Department to the requirements of Mr. C. E. Dunton, M.A., M.I.C.E., Chief Civil Engineer, London Transport. The contractor is Mitchell Brothers, Sons & Co. Ltd. of Victoria Street, London, S.W.1.

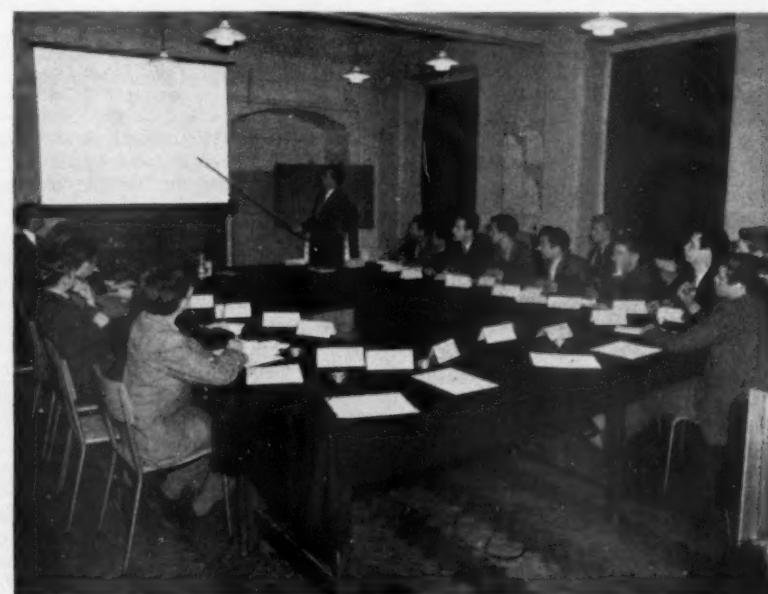
Railway development in the North East

Concluded from page 652

set out a few North Eastern beliefs. Everyone must be brought to understand more clearly what we are doing and what our aims are. There must be a clear conception of the degree of confidence which we have in ourselves and how much we are interested in the service we give. We must keep up with the times. Day-by-day we must think anew about our problems and revise our ideas. There must be continual adaptation and adjustment to meet changing conditions. Change must be accepted, indeed welcomed. We must be the initiators of change and not wait for it to be imposed upon us. We will continue to hear criticism of management. There is probably an inevitability about this when an industry is in difficulties. Maybe the difficulties will deepen. If so, we must be even more critical of ourselves. But as our modernisation programme goes forward, as we strengthen our relationship between management and staff, as we sense and encourage the rising public and trading interest in what after all is a British tradition, we shall grow ever more convinced that the existence of a stable railway system is essential to the national well-being—particularly in the North East, the birthplace of railways.

And the foregoing is written in the full knowledge that, at the time of submission, a recession in one of the great basic industries in the North East—iron and steel—is once again upon us. Equally it is written in the knowledge that great quantities of

traffic go by road. Our fortunes are inextricably linked with the heavy industries—maybe a deeper recognition of this, which is one of the things this article seeks to inspire, will ensure the survival of more than just the railway.



Trainee induction course at York, British Railways, North Eastern Region



Crane placing pre-stressed beam in position

PRE-STRESSED CONCRETE BEAMS used in bridge reconstruction

UNTIL its recent reconstruction, a road overbridge at Lawrence Hill, on the Bristol-South Wales section of British Railways, Western Region, consisted of one three-girder 70-ft. span and one four-girder 20-ft. span. It has been replaced by a single 85-ft. 6-in. composite span with multiple pre-stressed concrete beams and *in situ* concrete-fill decking.

Headroom increased

At the wish of the local authority, the new span has a width of 50 ft., compared with 30 ft. in the old spans, and erection was on a slightly different alignment. It is noteworthy as being the longest span on the Western Region with this type of construction. Also the 30 beams forming its main components are only 3 ft. 9 in. deep, this comparatively small construction depth enabling the railway headroom to be increased. One end of each of the beams is free and is carried on rubber blocks, the other end being fixed on bearing rails.

The widening and realignment of the superstructure has necessitated the leng-

Specially-designed lifting beam enables single crane to erect 85-ft. beams

thening of the abutments, and their widening has been dictated by the considerable increase in weight of the concrete as compared with the original steel decking. To effect this enlargement, concrete was placed by trenching behind the old abutments, and in the width where it was necessary to maintain road traffic, headings were driven.

One crane erects 85-ft. beams

For the erection of the beams limited line occupation caused by the density of the rail traffic prohibited the use of two locomotive cranes. A special lifting beam was therefore designed and built to enable each 20-ton beam to be lifted at two points 70 ft. apart. With the aid of this specially designed beam a 45-ton crane was able to manoeuvre each beam into position with the minimum of delay

to rail traffic.

For the decking ready-mixed concrete with a strength of 5,000 lb. per sq. in. at 28 days was used; tests showed that the average actual strength was over 7,000 lb. per sq. in.

The substructural work was done by contract but the superstructure was erected by direct labour employed by the Western Region of British Railways.

ALLHALLOWS BRANCH CLOSURE

The Southern Region of British Railways closed the Allhallows branch for passengers on December 4. Ten stations and halts have been affected, they are: Allhallows-on-Sea, Grain, Stoke Junction Halt, Middlestoke Halt, Belunce Halt, Sharnal Street, High Halston Halt, Cliffe, Uralite Halt, and Denton Halt.

PERSONAL

British Railways

MR. D. BAILEY, Passenger Officer, East Lancashire Divisional Traffic Manager's Department, Manchester, British Railways, London Midland Region, who, as recorded in our issue of November 10, as been appointed Traffic Assistant to the Divisional Traffic Manager, Manchester, joined the former London & North Eastern Railway in 1930 and was selected as a Traffic Apprentice in 1938. He served with H.M. Forces during the war and resumed his railway career in 1947. He became Chief of the combined District Operating and District



Mr. D. Bailey

Motive Power Superintendents' Staff Office at Newcastle-upon-Tyne in the same year and in 1948 became Assistant to the Executive Officer (Road Transport), Railway Executive. He became Cartage Assistant to the District Goods Manager, Broad Street, London, London Midland Region, in 1954, Assistant District Passenger Manager, Euston in 1958, and Passenger Officer, East Lancashire Divisional Traffic Manager's Office, Manchester, in 1959.

MR. D. FARR, Stationmaster, Coxwold, British Railways, North Eastern Region, has been appointed Goods Agent, Helmsley.

MR. D. W. M. FOX, B.COM., A.M.INST.T., Assistant District Traffic Superintendent, Woking, British Railways, Southern Region, who, as recorded in our October 6 issue, has been appointed Operating Officer, Central Division, joined the Southern Railway as a Cadet in 1934, and gained wide experience in a variety of positions. In 1948, he was appointed Assistant to the District Traffic Superintendent, Orpington, and in 1956 Senior Assistant to the District Traffic Superintendent at Southampton. A year



Mr. D. W. M. Fox

later he was appointed Assistant District Traffic Superintendent at Woking, and in 1960 became the Senior Assistant in that District.

MR. L. A. A. TAYLOR, Estate & Rating Surveyor, British Railways, Eastern Region, has retired. He has been succeeded by **MR. S. R. DASHWOOD**, Assistant Estate & Rating Surveyor.

MR. W. H. CAMPBELL, Stationmaster, Newcastle Central, British Railways, North Eastern Region, has retired.

MR. J. H. MAYDEW, Assistant Traffic Costing Officer at the British Transport Commission headquarters, who, as recorded in our October 6 issue, has been appointed Finance Assistant, Central Division, Southern Region, gained his first transport experience in the Divisional Office of the London Passenger Transport Board, from 1938 to 1942. He served for four years as a navigator in R.A.F. Bomber Command and on demobilisation resumed his former post for a short period. From 1947-1949 he worked in the Accounts Office of the London Transport Executive and then transferred to the British Transport Commission Acquisitions Division, where he was concerned with negotiations for the settlement of compensation payable to road hauliers whose firms were acquired by the Commission under the Transport Act of 1947. In 1954 Mr. Maydew was appointed to the B.T.C. Audit Division and a year later transferred to the B.T.C. Traffic Costing Service as an Assistant with the Traffic Costing Services team attached to the Southern Region at Waterloo. Since 1959 he has been Assistant Traffic Costing Officer with the London Midland Region at Euston.

MR. S. J. SYMES, District Traffic Superintendent, Stoke-on-Trent, British Railways,

London Midland Region, who, as recorded in our issue of November 24, has been appointed District Goods Manager, Birmingham, joined the former London Midland & Scottish Railway in 1933 and was selected as a Traffic Apprentice. After experience in the traffic departments he was appointed to the District Passenger Manager's Office, Leeds, in 1937. He was moved to the District Passenger Manager's Office, Euston, in 1938, and became District Inspector, Bletchley, in 1939. After service with H.M. Forces during the war he returned to railway service and was appointed Passenger Assistant to the District Manager, Stoke-on-Trent, and Head



Mr. S. J. Symes

of Passenger & Parcels Section, Commercial Superintendent's Office, Euston, in 1952. He became Assistant District Passenger Manager, Euston, in 1956, Head of Passenger Section, Divisional Traffic Manager's Office, London, in 1958, and District Traffic Superintendent, Stoke-on-Trent, in 1959.

MR. J. M. LEIGHTON-BAILEY, B.SC.(ECON), A.M.INST.T., Modernisation Assistant, Traffic Department, Waterloo, British Railways, Southern Region, who, as recorded in our October 6 issue, has been appointed Works Planning Assistant, Waterloo, joined the Southern Railway as a junior clerk at Goring-by-Sea Station in 1926. From 1927 to 1930 he held clerical posts in the Southern Divisional Commercial Manager's Office, Brighton, and the London (Central) Divisional Superintendent's Office, London Bridge. In 1932 he was selected for special training as a Cadet, attached to the General Manager's Office, and in 1938 he was appointed Outdoor Assistant to the Superintendent of Operation. His next appointment was that of Bursar of the Southern Railway Staff Training College, Woking, in 1946, and he became Assistant to the Superintendent of Operation two years

later. This latter post was redesignated General Assistant to the Chief Operating Superintendent in 1955. Mr. Leighton-Bailey was appointed Modernisation Assistant to the Operating Officer in 1958 and Works Planning Assistant, General Manager's Office, in 1961. He was awarded the Brunel Medal of London School of Economics in 1931.

MR. F. A. TRIBBLE, Assistant District Traffic Superintendent, Redhill, British Railways, Southern Region, who, as recorded in our October 6 issue, has been appointed Passenger Officer, Central Division, entered the service of the London & South Western Railway in 1921. Until 1941 he served in various departments of the District Traffic Superintendent's Office, Exeter, and was then promoted to Head of Trains Section. In 1954 he was appointed Assistant to the District Traffic Superintendent, Exeter, and in 1956 he became Assistant District Traffic



Mr. F. A. Tribble

Superintendent, Southampton. He was appointed Assistant District Traffic Superintendent, Redhill, in January, 1961.

Institution of Railway Signal Engineers

The following is a list of recent additions to, and transfers in, the Register of Members of the Institution of Railway Signal Engineers:

Members

MR. L. J. ROTHER, Chief Sales Engineer (Signalling & Telecommunications), Telecommunications Radioélectriques et Téléphoniques, Paris.

MR. H. J. M. DELUGEAU, Principal Engineer (Signalling), Telecommunications Radioélectriques et Téléphoniques, Paris.

MR. R. M. FOULKES, Section Leader, Associated Electrical Industries, G.R.S. Limited.

MR. C. V. N. SWAMI, District Signal & Telecommunications Engineer, Eastern Railway of India.

MR. C. D. MYRDAL, Signal Engineer (New Works), South African Railways.

Associate

MR. E. M. BUTTERWORTH, Chief Engineer, B. & R. Relays Limited.

Transfers from Associate Member to Member

MR. H. O. BALDWIN, Chief Signal & Telecommunications Engineer, British Railways, Scottish Region.

MR. B. J. HENSTOCK, Assistant Signal & Telecommunications Engineer, British Railways, Scottish Region.

Transfer from Graduate to Member

MR. J. A. HEALD, Assistant to Chief Signal & Telecommunications Engineer (General), British Railways, Western Region.

Transfer from Technician Member to Associate

MR. W. G. MORSE, Work Study Assistant, Signal & Telecommunications Engineering Department, British Railways, Western Region.

FISCHER succeeds MR. RAASCH as Managing Director of Hyster N.V. in Holland. MR. W. OETINGER has been appointed to succeed MR. FISCHER as Assistant Manager, Portland plant, U.S.A.

Transport Users' Consultative Committee

MR. A. J. ASHMAN, Secretary of the Radstock Co-operative & Industrial Society Limited, has been appointed a member of the Transport Users' Consultative Committee for the South West Area until July 31, 1962, in place of the late MR. W. G. DASCOMBE.

Obituary

We regret to record the death, on November 27 at the age of 76, of MR. R. W. FOXLEE, who was, until 1954, Engineer-in-Chief, Crown Agents for the Colonies and Engineer-



Mr. R. W. Foxlee

MR. V. HUNT has been appointed District Representative for Mexico, Central America, and the Caribbean for the Hyster Company.

MR. A. G. SMITH has been appointed Export Sales Manager, J. C. Bamford (Excavators) Limited.

MR. A. E. GRIMSDALE, Commercial Director, Associated Electrical Industries (Manchester) Limited, has joined the board of Nuclear Graphite in place of MR. G. S. C. LUCAS, Director of Engineering, Associated Electrical Industries (Rugby) Limited. MR. E. TANKARD has been appointed part-time Director (Finance).

MR. J. D. LEWIS, Director, Atlas Engineering Co. Ltd., left England for the Far East on December 5. On his way back he proposes to call at Singapore, Bangkok, Calcutta, Bombay, Johannesburg, and the Sudan.

MR. J. C. MASTERS, Northern Area Sales Manager, Univac Computer Division, Remington Rand Limited, has moved to Manchester to organise the Univac Computer Centre.

MR. H. RAASCH has been appointed Director of Marketing, Hyster Co. Ltd., for all the company's European operations. MR. P.

ing Adviser to the Secretary of State for the Colonies. Mr. Foxlee was the son of a civil engineer, MR. W. T. FOXLEE, and was educated at Westminster School. He commenced his career as a pupil of the late MR. ALEXANDER ROSS, then the Chief Engineer of the Great Northern Railway, from whence he went to the Great Central Railway until 1915, when he joined the Port of London Authority. In 1921, Mr. Foxlee joined the Crown Agents as Deputy Head of the Engineering Designs Department, was appointed a Deputy Chief Engineer (Civil) in 1928, and Chief Civil Engineer in 1945. He became Engineer-in-Chief in 1949, retiring in 1954.

We regret to record the death, on December 3, at the age of 84, of MR. G. W. PITTIGREW SMITH, Chairman & Managing Director of London Engineering Co. Ltd., and Director, Monarch Controller Co. Ltd.

We regret to record the death, on November 25, at the age of 41, of MR. N. FINCH, Leeds Area Manager, Crofts (Engineers) Limited.

NEW EQUIPMENT and Processes

BATTERY-DRIVEN TRACTOR

The Floataire 1H battery-operated tractor will tow 3 tons on level ground. It has been constructed of steel plates electrically welded to form a single unit. The three-wheel design has a single driving wheel in front which also is the steering wheel and is direct-coupled to the steering mechanism. A full 180-deg. lock and a drive in the direction of travel at all times increases pulling power.

The pedal control gives three forward speeds and three reverse. Maximum speed is 4·6 m.p.h. Brakes are by hand lever and pedal, the latter operating Lockheed hydraulic brakes on the rear wheels. Power supply comes from a 12-cell Kathanode traction battery having a capacity up to 429 A.hr. giving 8 hr. running on one charge.

Further details can be obtained from Floataire Limited, Joseph Street, Leicester.

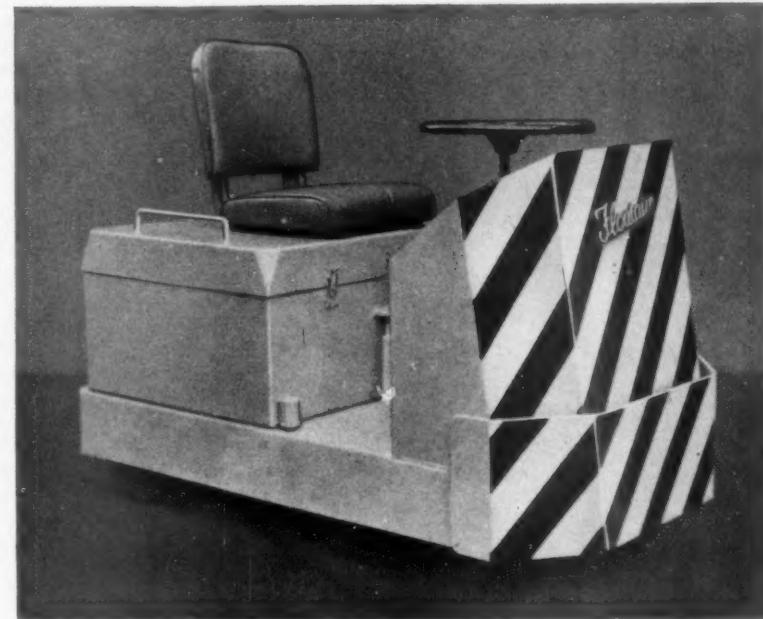
MULTIBLADE RATCHET SCREWDRIVER

An addition to the range of Darwin tools is a ratchet screwdriver with an amber-plastic pistol-grip handle and four interchangeable blades. A positive blade-locking device is included.

Further details can be obtained from J. Stead & Co. Ltd., Manor Works, Cricket Inn Road, Sheffield, 2.

CRANE CASTOR WHEELS

An adaptation of the Autoset heavy-duty sprung castor, described in our issue of June 16, 1961, has been supplied for a

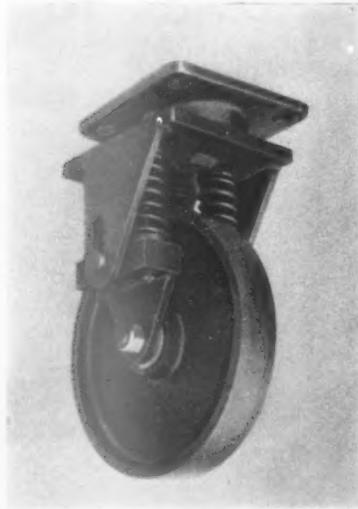


crane designed for lifting diesel engines in railway maintenance shops. The flanged headfitting used precision-machined thrust ball races and tapered roller races. The pivot spindle is of high tensile steel welded to a mild steel fabricated and welded fork. The wheel is supported by needle roller bearings within an independent fork unit on outboard-mounted spindles located in vertical slots. Four springs were fitted to give a pre-stressed load, with a spindle at the bottom of the slot, at 700 lb. Any load applied to the castor above this pressure causes depression of the castor until the spindle reaches the top of the slots. At this point leg extensions on the lifting crane contact the ground, so making the crane rigid.

Further details can be obtained from Autoset (Production) Ltd., Stour Street, Birmingham 18.

COLLAPSIBLE CASES

The hanging wardrobe CW 75 is the latest type of a range of collapsible containers supplied on a rental basis. Internally equipped as a hanging wardrobe, the outside of the container is designed as an efficient rail package, suitably reinforced, adequately labelled, and provided with fittings to assist handling on rail. It is collapsible for the return journey and lies flat for this purpose. It is stated that C. & A. Modes Limited is arranging

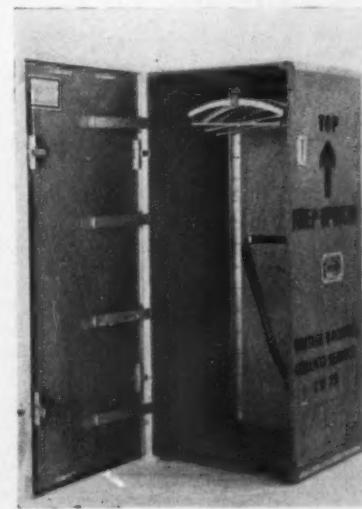


for its supplies to be delivered in this new type of container.

Another type recently introduced is of dimensions suitable for use on a forklift pallet.

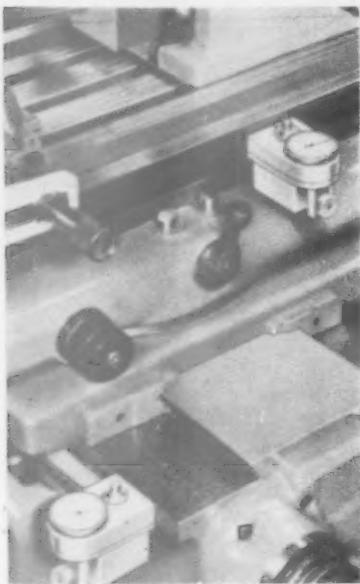
These containers, which are in use on British railways, are maintained by their manufacturers and are handled by the railway on a net load charge basis, the cases being returned free to user.

Further details can be obtained from Collico Limited, London Scottish House, London Road, Barking, Essex.



DIAL TRAVEL INDICATOR

The Trav-A-Dial indicator can measure lineal movement in thousandths of an inch between workpiece and carriage, slide, or tool position. It can be used in the machine shop and toolroom and for general application where lineal



movement of one component needs accurate measurement in relation to another.

The indicator is made to operate by a gauge wheel which rotates on a way or machined surface. A precision gear train transmits the motion to graduated dials and a continuous record is made up to six inches repeating as required. A zero return clutch is fitted. The indicator avoids errors due to backlash as it measures movement directly without reference to rotation of leadscrews or other motions in feed systems.

Accuracy to within one thousandth of an inch per six inches of travel is guaranteed.

The unit is manufactured in America by Southwestern Industries Incorporated, California.

Further details can be obtained from the British distributor, Apwar Limited, 37, Sheen Road, Richmond, Surrey.

FACSIMILE TRANSMISSION

The Redifax facsimile transmitter and receiver system is a closed circuit television circuit by means of which documents, drawings, diagrams or other paper work can be seen at a distance. The transmitter an Alden type 9165 is so designed, that up to 54 in. wide documents can be "transmitted" without folding on the 19 in. transmitter, sending 19 in. "strips," while wider sheets can

be handled without cutting, by folding. The system operates by passing the material over a flat surface, by means of feed rollers which pass the paper over an illuminated slit at the correct speed for optical scanning. Correct focus is assured by the action of the rollers. Signals from the scanning unit are amplified to a level sufficient to modulate the carrier frequency used for normal operation over telephone lines. The service will also operate on cable links or by radio. Two carrier frequencies are available but the higher operating speed requires that a telephone line of suitable band-width be available. Reception is by the Alden 9137 Facsimile receiver ideally. Monitoring equipment is available to ensure correct functioning of the equipment.

An alternative equipment is designed for the transmission of column width information, 2 in. wide. Any length of strip can be scanned. In this a combined transmitter and receiver unit is available as well as the normal two unit system. The scanning head and the recording unit are available to be built into a desk top if required. Two speeds are available, 500 lines and 3,000 lines per minute. The 500 lines system will operate over the normal telephone network.

The equipment for both systems is completely self-contained and can stand in offices or on the executive's desk. Several viewing stations can operate together and telephone communication at the same time as viewing is taking place, can be provided.

Further details can be obtained from Redifon Limited, Broomhill Road, Wandsworth, London, S.W.18.

METAL-CLEANING SERVICE

A new service offers metal cleaning by mechanical means, including shot blasting, in metal spraying and in the application of protective coatings. The mechanical removal of silica deposits on turbine blades and diaphragms is also undertaken.

At present confined to the North of England, the service is expected to be

available nationally in the near future.

Further details can be obtained from Bladite Limited, 2-8, St. John's Road, Bootle 20, Lancashire.

ADHESIVE FOR POLYSTYRENE

Evo-stik Impact adhesive SL865 has been introduced to provide an adhesive which bonds expanded polystyrene to wall and ceiling surfaces of various materials. It provides a strong bond on contact, by hand pressure only, which need not be sustained. While wet, slight adjustments can be made in position. Paint should be thoroughly wire-brushed, and distemper should be completely removed before application of the adhesive.

Further details can be obtained from Evode Limited, Industrial Adhesives Division, Common Road, Stafford.

HYDRAULIC LOADER

The 2X hydraulic loader is available with three sizes of bucket, $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{1}{3}$ cu. yd., interchangeable according to requirements, and each fitted with a wear-resistant blade. The payload for the $\frac{1}{3}$ cu. yd. bucket is 1,000 lb., and for the remainder, 1,200 lb.

The tip and bucket reset are both operated by double-acting hydraulic rams which furnish 2,500 lb. pry-out force to the 50 deg. rollback action. The main beams and bucket are lifted by single-acting rams with a potential force of 2,800 lb.

The rams receive hydraulic power from a heavy-duty pump built into the engine and direct driven. This engine is a Petter P.N.2T. air-cooled diesel developing 17 b.h.p. at 1,800 r.p.m. with a maximum torque of 48 lb.ft. at 1,650 r.p.m. It drives the loader through a single plate clutch, and three-speed and reverse gearbox. The semi-floating front axle is solid mounted to the frame and driven through a bevel differential. Brakes are mechanically operated by hand or foot.

Further details can be obtained from E. Boydell & Co. Ltd., Old Trafford, Manchester.



LONDON COMMERCIAL SERVICE

Railway commercial representation in London to be controlled from Regional offices

British Railways local traffic officers have been given greater powers to enable them to meet the requirements of their customers quickly and effectively, and as a development of this policy they wish to establish closer and more direct ties between themselves and their customers.

From January 1, 1962, the commercial representation of the railways on goods and parcels matters, which is at present carried out by the London Commercial Service at

13, Aldersgate Street, E.C.1, will be undertaken by separate regional organisations under the control of the traffic officers. The names, addresses, and telephone numbers of these officers are given below.

Although the representatives calling on customers will change, it is expected that in the long run it will be better for both customers and railway representatives to be in more direct association with the traffic officers.

The London Commercial Service (Passenger Travel) and the Overseas Freight Service will not be affected by the change.

The London Commercial Service was set up about 14 years ago to co-ordinate the railway's commercial representation in London on behalf of all Regions, including the Scottish and North Eastern Regions, although these two had no headquarters in London.

EASTERN REGION

Great Eastern Line

H. W. Few,
Traffic Manager,
Hamilton House,
155 Bishopsgate, E.C.2.

Great Northern Line

G. F. Huskisson,
Traffic Manager,
Great Northern House,
79/81 Euston Road, N.W.1.

London, Tilbury & Southend Line

J. W. Dedman,
Line Traffic Manager,
Fenchurch Street, E.C.3.

LONDON MIDLAND REGION

Midland Line

K. N. Sidebotham,
District Commercial Manager,
St. Pancras Chambers, N.W.1.

Western Line

District Goods Manager,
Broad Street Station, E.C.2.

F. J. W. Wagstaff,
District Passenger Manager,
Euston House,
Eversholt Street, N.W.1.

SOUTHERN REGION

South Eastern Division

T. R. V. Bolland,
Line Traffic Manager,
61, Queen Street, E.C.4.

South Western Division

F. P. B. Taylor,
Line Traffic Manager,
Waterloo Station, S.E.1.

Central Division

G. A. Weeden,
Line Traffic Manager,
Essex House, Croydon,
Surrey.

E. R. Fearnhead,
Chief Sales Representative,
South Bank House,
Black Prince Road,
Albert Embankment, S.E.11

Western Region

G. A. V. Phillips,
Divisional Traffic Manager,
Paddington Station, W.2.

S. C. Harvey,
Divisional Goods Commercial Officer,
Paddington Station, W.2.

R. J. Hill,
Divisional Passenger Commercial Officer,
Paddington Station, W.2.

Bishopsgate 7600
Ext. 2429
,, 2528

Terminus 3677
Ext. 2641
,, 2777
,, 2778

Royal 4591
Ext. 128

Terminus 7000

Avenue 7535
Ext. 233
,, 234
Euston 1234
Ext. 454
(Parcels Transits)
Ext. 445 (Claims)

Waterloo 5151

Waterloo 5151

Municipal 2544

Reliance 1443

Paddington 7000

Paddington 7000

Paddington 7000

Railway de-centralisation in the North West

To increase efficiency and enable the railways to compete effectively in the transport market, there has been a complete re-organisation of the traffic departments on the London Midland Region. Until quite recently the district officer—Operating Superintendent, Commercial Manager, or Motive Power Superintendent—was directly responsible to his own departmental chief at Euston. This arrangement was often a hindrance to efficient working because of insufficient local co-ordination.

Divisional managers

As a first step in the breakaway from this centralised control of functions, six Divisional Traffic Managers were appointed on the London Midland Region in 1958. In the North-West, the East Lancashire Divisional Traffic Manager, Manchester, controlling one Passenger Manager, two Goods Managers, three Operating Superintendents and three Motive Power Superintendents, has been able to bring about a greater degree of inter-departmental co-ordination and give quicker decisions. Even so, much authority has up to now still been retained at Euston.

A further step in de-centralisation has been taken by the setting up of three Line Traffic Managers (at Derby, Crewe, and Manchester). The L.T.M. at Manchester controls three divisions. (1) Merseyside & North Wales. (2) East Lancashire. (3) Northern. The advantage of having higher management on the spot is already making itself felt. Each of the L.T.M.'s is responsible direct to the General Manager, who with a small staff will continue to be responsible for overall regional policy and decisions. This new traffic organisation not only results in higher management being more aware of local needs and developments, but also gives the flexibility of operation required to provide a good service to the public.

Hemel Hempstead & Boxmoor Station

From July to October, 1837, Boxmoor was the terminus of the main line from Euston. Since then the area has developed slowly, mainly for residential purposes, and industry has only comparatively recently extended into the vicinity. The construction of the new town at Hemel Hempstead has quickly raised the population to some 50,000 people.

Railway traffic has increased from this surge in population and extension of industry, and the present facilities at Hemel Hempstead & Boxmoor Station are now inadequate. The appearance of the station is also out of harmony with the modern buildings of the new town.

The new station at Hemel Hempstead & Boxmoor, which will cost nearly £70,000, will be on the same site as the present one, with an entrance building giving access to the platforms from the eastern side of the line. The entrance-hall block will include a booking office, parcels office, and toilet facilities. The ceiling will be of pinewood, and the walls of Swedish-type tiles. The subway leading from the entrance hall will be modernised and the stairways rebuilt.

The platforms will be extended to accom-

modate ten-coach multiple-unit electric trains, and each platform will have a waiting room with pushbutton electric heating. The Stationmaster will have an office on the Down-slow platform, where staff accommodations and amenities will be located.

The station buildings will be faced with dark-blue brickwork, above which the timber fascia will be painted green. Demolition of the present station will begin early next year.

Lightweight locomotives for Indian metre-gauge lines

Alco Products Inc. has developed and is delivering to several railways in the world a lightweight locomotive that meets very restrictive clearance conditions. This is ALCO DL-535.

The unit has a basic weight of 77 tons when fully loaded; its maximum height is 11 ft. 1 in.; its maximum width is 9 ft., and its length over frame ends is 45 ft. 4 in.

Power is obtained from an ALCO six-cylinder, 9 x 10½ in., four-stroke, highly turbo-supercharged engine, with charge air-cooling. This engine's basic rating, under U.I.C. conditions, is 1,350 b.h.p. at 1,100 r.p.m.

The first shipment of the DL-535 locomotives was for India. The Indian Railways will assign these locomotives to all services in the north-eastern part of the country.

In the DL-535 locomotives, the chassis design used successfully in several thousand large diesel-electric locomotives has been modified, increasing the space between main longitudinal members, and allowing the engine to be mounted in an unusually low position. As a result, the overall height of the unit is approximately 3 ft. 5 in., less than that of a typical American unit. This chassis construction affords roominess in the cab, in spite of the restrictions imposed to locomotive height.

The locomotive is mounted on two three-

axle, three-motor trucks of the ALCO Trimount design, which can be adapted for all gauges from 36 in. to 5 ft. 6 in. The Indian units were built for the metre gauge used in the north-eastern area of the country.

The ALCO Trimount truck, used in over 700 locomotives now operating all over the world, consists of a single-piece, cast-steel, stress-relieved frame, receiving the locomotive weight through a conventional pivot located towards one end and two loadings channels towards the other end.

The "end-loaded" type of construction greatly minimises the weight transfer caused by traction-motor torque reaction and accordingly reduces considerably one of the main reasons for low-speed wheel slip.

Other DL-535 units, differing from the ones for India in some details dictated by local conditions, are being manufactured and are in schedule at ALCO's Schenectady plant to fill other orders from overseas railways.

Railways for road vehicles

A 150-m.p.h. car train is proposed in Germany to supplement the main autobahn running from the Ruhr to Stuttgart. This is one of the busiest roads in Germany carrying mainly long-distance traffic.

The car train has been suggested by a Munich professor, who suggests building a railway along the 200 miles of the existing road to carry lorries and cars only.

The trains would be 19 ft. high and 16 ft. wide, able to carry from 14 to 16 medium sized cars on two decks. Commercial vehicles would be carried in coaches of the same size but without the second deck. Passengers would be able to stay in their vehicles for the short ride, or could spend the time in restaurants provided on the train's upper deck. Special ramps would enable vehicles to be quickly loaded on and off by their own drivers.

The attraction claimed for the scheme is

that the cost of conveying a vehicle by train along the length of the road would be less than that of driving it along under its own engine power. Also the journey would be quicker and would be less strain on the driver.

The cost of building a 250-mile railway capable of carrying 10,000 vehicles a day in one direction is estimated at £200 million.

Exhibition train

A 13-week, 1,600-mile tour of Great Britain by an exhibition train will be a feature of the Solid Fuel Central Heating Campaign, to be mounted jointly next spring by the Coal Utilisation Council and the National Coal Board.

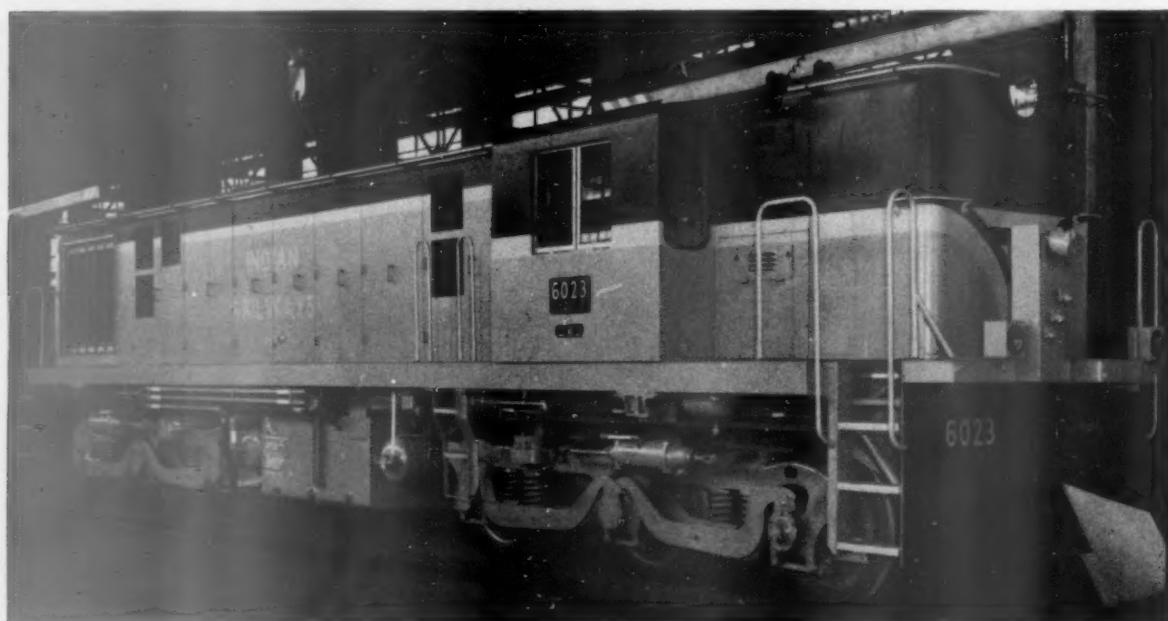
To be known as the "Cosy Train," this unit, in white, yellow, and black livery, will be used to focus public attention on a concentrated programme of exhibitions and show houses opening in early April.

It will start from Victoria Station, London, on April 2, and will make three-day halts in various towns all over England.

Working demonstrations of full and partial central heating by solid fuel will be given on board, designed by the Coal Utilisation Council's display staff, specially for the 1962 Central Heating Campaign.

The first coach will be devoted to partial central heating, displaying small-pipe systems operating from an open fire and a stove with high-output back-boilers. The second coach will illustrate full central heating: there will be examples of small-pipe systems working from modern independent boilers of varying outputs. Each of these coaches will have its own information bureau and displays of appropriate fuels.

The third coach will be equipped with collapsible seating along both walls and will serve as an information lounge, lecture theatre, or small cinema. It will have catering facilities for special receptions and party visits and a comprehensive library of central heating literature and N.C.B. educational



Alco DL-535 diesel-electric locomotive for Indian Railways

films. This coach will house a generator, providing the train with electric lighting, ventilation, and power for the pumps in the working central heating systems. It will also contain a fuel store, with supplies for the working exhibits, and a galley kitchen with water storage tanks.

The train will have its own retractable entrance and exit steps, constructed on air-liner lines, for use when standing away from platform.

Alterations to "Rheingold" service

The first-class-only Rheingold train at present starting from the Hook of Holland is shown in the German Federal Railways summer timetable for 1962 as starting from Amsterdam, as was the case when it was first introduced many years ago. In the interests of travellers from and to Britain, two through coaches from the Hook of Holland will be attached to the train at Utrecht, one via Basle with Coire (Chur) as its final destination and the other via Frankfurt to Munich. The timetable will be as follows:—

Hook dep. ...	6.48
Utrecht arr. ...	7.43
" dep. ...	7.54
Duisberg arr. ...	9.39
" dep. ...	9.49
Frankfurt arr. ...	12.57
Munich arr. ...	17.28
Basle arr. ...	15.32

As recorded in our issue of November 24, the train will have a new type of passenger coach.

Parliamentary Notes

Valuation of the railways

In the general discussion on the White Paper on Public Investment, Mr. Henry Brooke, Chief Secretary to the Treasury, said that emphasis was laid on the financial performance of each of the nationalised boards, and that financial targets for each of them were being set. The standing and management of each of these industries is to be improved, and to keep demands on the Exchequer down investment should not be controlled in such a way as to jeopardise their ability to reach their financial targets. It was by this standard, as well as by the need to provide essential supplies and services, that it is proposed to judge the investment proposals by the nationalised industries.

Mr. David Webster (Weston-super-Mare—Con.) said that the Government wrote off a tremendous amount of capital last week. He was very concerned, in particular, about the British Transport Commission and the last valuation put on its assets. In the last accounts of the B.T.C. £29 million worth of assets represented land and buildings not in operational use. When on another page of the report, last year the net receipts from these were £4.9 million. That, on the face of it, was a highly satisfactory result, giving a 16 per cent earnings yield before tax.

Those assets were last valued, at the very latest, in 1938 and were put on the books of the B.T.C. under the 1947 Act at valuation. Those assets, being mostly property, would have increased and multiplied at least three-fold, in which case they would have a valuation today of £75 million. That would bring down the £4.9 million to a 6 per cent gross

return before tax.

This showed that our nationalised industries were without adequate valuation. We could not tell what the assets were.

Questions in Parliament

Railway closures in Scotland

Mr. E. Willis (Edinburgh E.—Lab.) asked the President of the Board of Trade on November 28 what consultation took place between his department and the British Transport Commission before the recently announced rail closures in Scotland regarding the number of men likely to be in need of new jobs.

Mr. Niall Macpherson, Parliamentary Secretary, Board of Trade, said that no consultation had taken place but added, in a written answer to Mr. Willis, that there was not likely to be an appreciable loss of jobs as a result of the rail closures and that there should be no redundancy.

New stations in North Staffs

Mr. Ellis Smith (Stoke-on-Trent S.—Lab.) asked the Minister of Transport on November 30 what expenditure he had authorised for new railway stations in North Staffordshire; and whether he included the modernisation of Stoke-on-Trent station.

Mr. E. Marples said in a written answer that the British Transport Commission had not put to him any proposals for capital investment in new railway stations in North Staffordshire. In connection with the London Midland electrification scheme, it had allocated about £120,000 for improvements to stations on the Staffordshire and Cheshire sections of the North Staffordshire railway line. The London Midland Region was considering plans for modernising Stoke-on-Trent station.

Mr. Ellis Smith asked the Minister of Transport what capital expenditure had been authorised for the electrification of the North Staffordshire railway line; whether such expenditure included the Crewe-Kids Grove line, the main line by-pass of the Harecastle Tunnel, and the North Staffordshire loop line; and when it was expected that electrification will be completed.

Mr. Marples in a written answer said that electrification of the North Staffordshire line was part of the London Midland Region electrification scheme which he approved as a whole.

The British Transport Commission had so far authorised expenditure of £5,142,100 for works and plant for electrification between Cheadle Hulme and Kids Grove Central and between Stoke-on-Trent and Colwich. Electrification of the North Staffordshire line would involve the provision of a main line by-pass for the Harecastle tunnels. It should be completed in 1966. The total cost was estimated at £8,200,000.

The Commission had no plans for electrifying either the Crewe-Kids Grove line or the North Staffordshire loop line.

Staff & Labour Matters

"Work to Rule" upsets Southern Region peak-hour traffic

A decision to work to rule on the part of the drivers at Gillingham Motive Power Depot on the Southern Region of British Railways

caused considerable delay to morning and evening peak hour traffic on Monday, December 4.

This action was in protest against the attitude of the British Transport Commission to the claims, which are being dealt with at national level, in respect of higher rates of pay and shorter working hours.

Claims for higher rates of pay for railway salaried and conciliation staff were submitted recently to the Railway Staff National Council by the A.S.L.E. & F., N.U.R., and T.S.S.A. and the Commission's reply will be given in due course.

Discussions have been taking place between the unions and the Commission in regard to the Commission's promise to consider a reduction of two hours in the standard working week for railwaymen provided ways and means could be found to reduce its impact and keep the overall cost within reasonable limits. Certain aspects on which it has not been possible to reach an understanding in the joint discussions have been referred by the unions to the Railway Staff National Tribunal for determination. The tribunal met on Wednesday, December 6, to hear the parties' submissions and its decision is now awaited.

As the matters on which the Southern Region drivers have taken action are being dealt with in the negotiating machinery, their attitude is against union advice and A.S.L.E. & F. members in the Southern Region have been asked not to flout their union's instructions by taking part in the demonstration.

CONTRACTS & TENDERS

\$450,000 export order from Canada

The Automatic Telephone & Electric Co. Ltd. has received orders from the Canadian National Railway Company and the Canadian Pacific Railway Company valued at \$450,000. The orders are for transistorised CM type telephone and broadcast channelling equipment for use on existing radio bearer circuits between Moncton-Halifax-Sydney and Moncton-Quebec-Montreal. This equipment reinforces existing open-wire line routes and caters for future expansion in these areas.

Leonard Fairclough Limited, Aldington, Lancashire, has been awarded two contracts by the British Transport Commission. They are for an underbridge to carry the Liverpool and Manchester railway line over Heyton Hey Road, Heyton and an underbridge to carry the railway over Bletchley Road, Buckinghamshire.

Matisa Equipment Limited has supplied two ballast cleaners, model 8CB5, to British Railways, Scottish Region and Southern Region, respectively. The Finnish State Railways has ordered a Matisa B-60 heavy duty automatic ballast tamper, fitted with Matisa automatic levelling equipment and has recently taken delivery of three lightweight automatic ballast tampers, model BL-09

equipped with motorised trolleys for single operator control, and a compactamper.

The British Transport Commission (South Wales Docks) has placed the following contracts:—

J. Westwood & Co. Ltd.: supply of six iron-ore grabs for use with 10-ton cranes at Barry Docks;

Rogers & Davies: construction of new Stores Department building and associated works, Swansea Docks;

Steel Engineering Products Limited: supply of two six-ton Coles mobile cranes, Cardiff Docks.

British Railways, North Eastern Region, has placed the following contracts:—

Denis Ferranti & Co. Ltd.: provision and installation of a transformer in the control tower sub-station at the Tyne Marshalling Yard;

Auto Diesels Limited: renewal of the signalling standby alternator at Hull Paragon Station;

H. & R. Wylie Limited: construction of a flat-roofed three-storey office block for the Yardmaster's and Staiths Superintendent's staff at Blyth;

Brightside Heating & Engineering Co. Ltd.: supply and erection of a low-pressure hot water heating installation in the central boiler house, central block, down yard control buildings and hump yard inspector's office at the Tees Marshalling Yard;

Williams & Williams Limited: supply and erection of sheeting and patent glazing for the roof of platform Nos. 1 and 2 at Bridlington;

Arundel (Contractors) Limited: painting of bridges, signalboxes, signals, small buildings, mile and gradient posts, on the Spen Valley Junction to Farnley Line, between Mirfield and Diggle and between Hebden Bridge and Wakefield;

Enfield Standard Power Cables Limited: provision and installation of cables for the new signalbox at Hessle Road, Hull;

A. Sanderson (Builders) Limited: repairs to the coal cells at Market Weighton Goods Station;

Steel Equipment Co. Ltd.: provision and installation of a double-tier storage structure and ancillary equipment at Shildon Wagon Works;

W. & T. Avery Limited: provision and installation of a 100-ton chain testing machine at North Road Locomotive Works, Darlington;

R. Costain (Construction) Limited: construction of control tower at the Tyne Marshalling Yard;

J. R. Deacon Limited: conversion of an existing building into a boiler room and the installation of toilet facilities at the Leeman Road canteen, York.

The Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Argentina:

Railway points, switches, and shunting apparatus.

The issuing authority is the Argentine/Bolivian Mixed Railway Commission (Commission Mixta Ferroviaria Argentina-Boliviana Construcción Ferrocarril Yacuiba-Santa Cruz de la Sierra-Sucre) Calle Charcas

1422, 4° piso, Buenos Aires, to which bids should be sent. Specifications and details are obtainable from the above address. The tender No. is 63. The closing date is January 2, 1962. The Board of Trade reference is E.S.B./34924/61.

From Formosa:

10 all-steel flat cars, 50 ton capacity, for operation on 30 kg. per m. 1,067 mm. gauge track.

The issuing authority is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan, to which bids should be sent. The tender No. is GFB-11173. The closing date is December 12, 1961. The Board of Trade reference is E.S.B./36018/61.

From India:

Supply of equipment and technical details in connection with the provision of automatic signalling between Mugma and Pradhukanta.

The issuing authority is the General Manager, Eastern Railway, Calcutta, to whom bids should be sent. The tender No. is ER/auto-signalling/v. The closing date is April 9, 1962. The Board of Trade reference is E.S.B./34651/61.

From Iraq:

400,000 standard-gauge wooden sleepers.

The issuing authority is the Iraqi Republican Railways. Bids should be sent to the Secretary, Tenders Opening Committee, Ministry of Communications, Baghdad. The tender No. is 15. The closing date is December 24, 1961. The Board of Trade reference is E.S.B./36318/61.

From Pakistan:

32,462 springs of sorts for carriages.

The tender No. is P-254/PIC/1-61. The closing date is December 12, 1961. The Board of Trade reference is E.S.B./35744/61.

5,400 screw couplings.

The tender No. is P-254-A/PIC/1-61. The closing date is December 21, 1961. The Board of Trade reference is E.S.B./35743/61. The issuing authority for the above tenders is the Chief Controller of Purchase, Pakistan Western Railway, Empress Road, Lahore, to whom bids should be sent.

From South Africa:

11,000 sealed-beam locomotive headlight lamps, 200 W. 30 V. P.A.R. 56 bulb with screw terminal base.

The issuing authority is the Stores Department, South African Railways, to which bids should be sent. The tender No. is C8882. The closing date is December 22, 1961. The Board of Trade reference is E.S.B./35795/61.

From the Philippines:

2 10 h.p. stationary car spotters, capstan type, complete with appropriate controls incorporating overload, short circuit, and under-voltage protections, to operate from a 220 V., 3-phase 60 cycle power source. Motor and controls to be such as to provide a low starting current inrush. (Meralco requirement.)

4 single rope sheave for an allowable rope pull of 10,000 lb. and for use with 1½ in. x 2 in. O.D. manila rope.

The issuing authority is the Purchasing

Agent, Manila Railroad Company, Tutuban Terminal Building, Manila, to whom bids should be sent. The tender No. is 59. The closing date is December 26, 1961. The Board of Trade reference is E.S.B./36679/61.

From Sudan:

Supply of 80 metric tons of lubricating oil for Gardner diesel engines.

The tender No. is 2426. The closing date is January 8, 1962. The Board of Trade reference is E.S.B./36922/61.

1,700 ft. h.t. copper cable 3 x 0-03 (19/0-044) sq. in. underground.

1,700 ft. wire netting galvanised, 2-ply selvedges 1½ in. hexagonal s.w.g. 16 width 30 cm.

1 3-panel h.t. metal-enclosed truck-type switchgear for 11,000 V. 3-phase, 50 cycles per sec., 250 kW.

5 junction boxes for 11,000 V.

3,000 ft. l.t. underground copper cable.

The tender No. is 2511. The closing date is January 3, 1962. The Board of Trade reference is E.S.B./36921/61. The issuing authority is the Office of the Controller of Stores, Sudan Railways, Atbara (P.O. Box No. 65) Sudan, to which bids should be sent.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

NOTES AND NEWS

London Underground Railway Society. The London Underground Railway Society, formerly the London Transport Railway Society, was inaugurated at its first meeting on November 17.

British-German co-operation. The Holset Engineering Co. Ltd. and Aktiengesellschaft Kühnle, Kopp & Kausch, Frankenthal/Pfalz, have agreed on a long-term co-operation in sales and research, based on exchange of information and experience.

Car park extended. The car park at Morden Station (Northern Line) has been extended and with a capacity for 410 cars is now the largest on the London Transport system.

British Transport Advertising. British Transport Advertising has announced that, between them, Associated Newspapers, the Beecham Group, and the National Milk Publicity Council are to use 1,560 bus side positions during 1962. The National Milk Publicity Council's posters will be appearing on bus sides in selected provincial centres as well as in London.

Flooding halts Spanish trains. The city of Seville was subject to severe flooding recently.

San Bernardo Station was affected and trains for Cadiz, Malaga, and Granada were delayed.

Aluminium-core power cable. The Aluminium Wire & Cable Co. Ltd. is to market its Solidal p.v.c. aluminium insulated power cable on a large scale next year.

Polypenco move. The office of Polypenco Limited, of Tewin Road, Welwyn Garden City, Hertfordshire, has been moved to Gate House, Fretherne Road, Welwyn Garden City. The telephone number remains Welwyn Garden 25581.

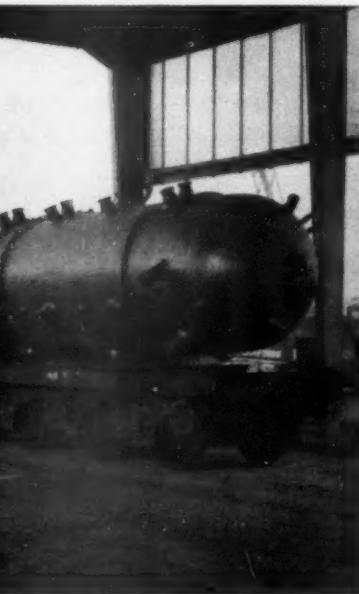
Nairn Station lighting. The modern electric lighting, recently installed at Nairn Station, on the Aberdeen-Inverness main line of the Scottish Region of British Railways, was switched on by the Provost of Nairn, Colonel G. Borwick, on November 27.

More camping coaches. The British Transport Commission is to make available 234 camping coaches, including 47 of the luxury Pullman coaches, during 1962, sited at 130 holiday centres. This is more than ever before.

Oral resuscitation. The London Midland Region of British Railways has provided a life-size model to demonstrate the mouth-to-mouth method of artificial respiration to its London No. 1 District ambulance class.

Railway Benevolent Institution. At its meeting on November 20, the Railway Benevolent Institution granted annuities involving additional liability of £114 a year. Gratuities during October to meet cases of immediate necessity amounted to £1,430 and grants from the Casualty Fund were £564.

Public film shows at Euston. The London Midland Region of British Railways has resumed public film shows in the train arrival bureau at Euston Station. The illustration above shows a film being shown to travellers.



The 155-ton boiler being prepared for transfer from rail to road



Public film show at Euston, British Railways, London Midland Region

particular its significance to the Darlington & Tees-side area. The exhibition was opened by the Mayor of Darlington, Councillor R. H. Loraine, on December 5, in the Art Gallery of the Public Library, Crown Street, Darlington, and is open to the public.

Locomotive Engineers' luncheon. The annual luncheon of the Institution of Locomotive Engineers will be held at the Dorchester Hotel, London, W.I., on Friday, March 2. Mr. J. F. Harrison, President, will be in the chair.

Car parks for suburban Underground stations. The London Transport Executive is to provide more car parks at suburban Underground stations, to encourage travellers to leave their cars in the suburbs. Under a programme which starts next year car parks will be provided at Acton Town, Canons Park, Queensbury, and Rickmansworth. Existing car parks at Mill Hill East, Newbury Park, and Snaresbrook will be enlarged.

International Nickel Co. (Mond) Ltd. exhibit. The International Nickel Co. (Mond) Ltd. is to exhibit at the Exhibition of Scientific Instruments & Apparatus, at the Horticultural Halls, London, January 15-19, 1962. Information will be presented on nickel-cobalt alloys for magnetostrictive transducers; nickel base alloys of controlled modulus for use in electro-mechanical filters, delay lines, and precision springs; carbonyl iron powders for tuning cores, and nickel thorium alloys for valve components.

Railway Stock Market

Business in foreign rails was scarcely adequate to test quotations, but activity persisted in Paraguay Central prior lien debentures, which held their recent advance with business up to 23. Antofagasta ordinary stock remained at 16½, but on balance the preference stock moved fractionally lower at 35. Mexican Central "A" bearer debentures receded to 56½, and San Paulo Railway 3s. units at 1s. 9½d. have been maintained on balance. Chilean Northern 5 per cent first debentures at 48½ and Costa Rica ordinary stock at 35 were maintained on balance. Guayaquil & Quito assented bonds were 55 and International of Central America shares kept at \$13½, with the preferred stock \$84.

Canadian Pacifics eased from \$43½ to \$43½, the preference stock from 59 to 56½, and the 4 per cent debentures from 53½ to 52½. Nyasaland Railways shares were again 11s. with the 3½ per cent debentures 35. West of India Portuguese capital stock was 139½ and Barsi Light Railway stock was again quoted at 17. Midland of Western Australia ordinary stock was 11 and Emu Bay 44 per cent debentures 39½.

Among shares of locomotive builders, engineers and kindred companies main attention again centred on Gloucester Wagon 10s. shares, which remained active in view of the take-over bid from Wignet, but after changing hands up to 13s. 6d. the shares came back to 13s. Wagon Repairs 5s. shares have been firm at 26s. 3d. Beyer Peacock 5s. shares were 7s. 4½d., Charles Roberts 5s. shares 4s. 4½d., while North British Locomotive firmed up to 5s. Elsewhere, Westing-

house Brake reflected fears of a reduced dividend and at 23s. 9d. were at their lowest for the year; yield on the basis of last year's 14 per cent dividend is over 9 per cent.

In other directions, Pressed Steel 5s. shares firmed up to 17s. 3d., Dowty Group 10s. shares have been steady at 29s. 6d. at the time of writing.

Pollard Bearing 4s. shares were steady at 33s., Ransome & Marles 5s. shares 15s. 3d., Vickers remained around 25s. 6d., at which the yield is 7½ per cent, but Renold Chain have been firm at 44s. 6d. Ruston & Hornsby were 20s. 3d., Mather & Platt 37s. 6d., while Stone-Platt, after a further decline, attracted buyers and at the time of writing have rallied to 38s. 6d. In electrics, English Electric remained under the influence of the interim statement, and at 25s. 3d. reached their lowest for the year. A.E.I. were 30s. 6d. and G.E.C. 25s. 3d. Among machine tools, Alfred Herbert showed firmness at 64s. and also Coventry Gauge 10s. shares at 32s. 7½d. B.I.C.C. were 57s. 4½d. and Broom & Wade 5s. shares 22s. 3d.

Region, London Lecture & Debating Society, Headquarters Staff Dining Club, Paddington, at 5.45 p.m. Discussion on "The means by which the railway image can be improved in the minds of the public."

Dec. 14 (Thu.). British Railways, London Midland Region, Lecture & Debating Society, East Lancashire division. "Coming Events," by Mr. M. G. E. Lambert, Line Traffic Manager, Manchester.

Dec. 14 (Thu.). Institution of Locomotive Engineers. Annual dinner and dance at the Dorchester Hotel, 7.15 p.m.

Dec. 14 (Thu.). Railway Students' Association, debate with British Railways, London Midland Region, Lecture & Debating Society. Clerical Staff Dining Club, Cardington Street, Euston, at 5.45 p.m. "That a policy of reduced fares and charges leading to more traffic would be preferable to a reduction in facilities."

Dec. 14 (Thu.). Diesel Engineers & Users Association, at 76, Mark Lane, E.C.3, at 2.15 p.m. Presentation of annual report on oil and gas engine working costs and performance.

Dec. 16 (Sat.). Norbury Transport & Model Railway Club, St. Stephen's Church Hall, Thornton Heath, from 11 a.m. Transport & travel exhibition.

Dec. 18 (Mon.). Institute of Transport, 80 Portland Place, W.I., at 5.45 p.m. Annual general meeting of Corporate members.

Dec. 19 (Tue.). Railway Enthusiasts' Club, Brunswick Club, 30, Wandsworth Road, S.W.8, at 7.30 p.m. "The railways of New Zealand," by Mr. J. B. Snell.

Dec. 21 (Thu.). Institution of Locomotive Engineers, at 1, Birdcage Walk, S.W.1, at 5.30 p.m. "The engineering aspect of catering on trains," by H. Wilcock, W. E. Bulman, and H. Simons.

Mar. 2, 1962 (Fri.). Institution of Locomotive Engineers, Dorchester Hotel, W.I. Annual luncheon.

Forthcoming Meetings

Dec. 8 (Fri.). Institute of Transport, Northern section, Royal Station Hotel, Newcastle, at 6 p.m. "The place of the public carrier in Britain," by T. G. Gibb, M.Inst.T.

Dec. 9 (Sat.). Historical Model Railway Society, Euston Hotel, London at 2.30 p.m. Annual general meeting.

Dec. 9 (Sat.). Permanent Way Institution, East Anglia Section, Ipswich, at 2.15 p.m. Films and discussion.

Dec. 11 (Mon.). Permanent Way Institution, London Section, British Transport Commission, Marylebone Road, N.W.1, at 6.30 p.m. "Inspection of materials," by Mr. F. K. Ford.

Dec. 13 (Wed.). British Railways, Southern Region, Lecture & Debating Society, Chapter House, St. Thomas' Street, London Bridge, at 6 p.m. "Some thought on railway organisation," by D. S. M. Barrie, Assistant General Secretary, British Transport Commission.

Dec. 14 (Thu.). British Railways, Western

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LONDON MIDLAND REGION

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BRITISH RAILWAYS, LONDON MIDLAND REGION,
EUSTON STATION, LONDON, N.W.1.



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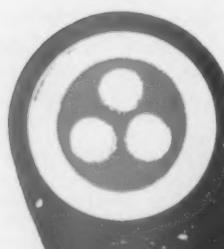
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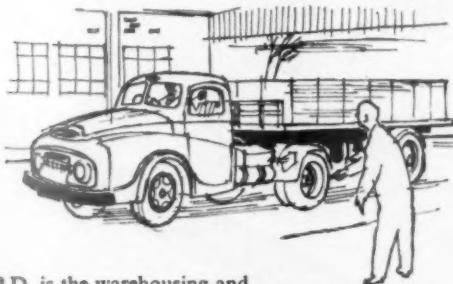
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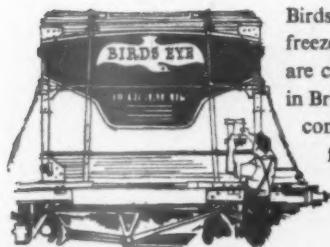
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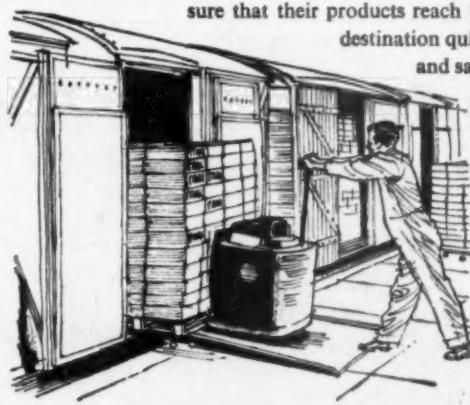


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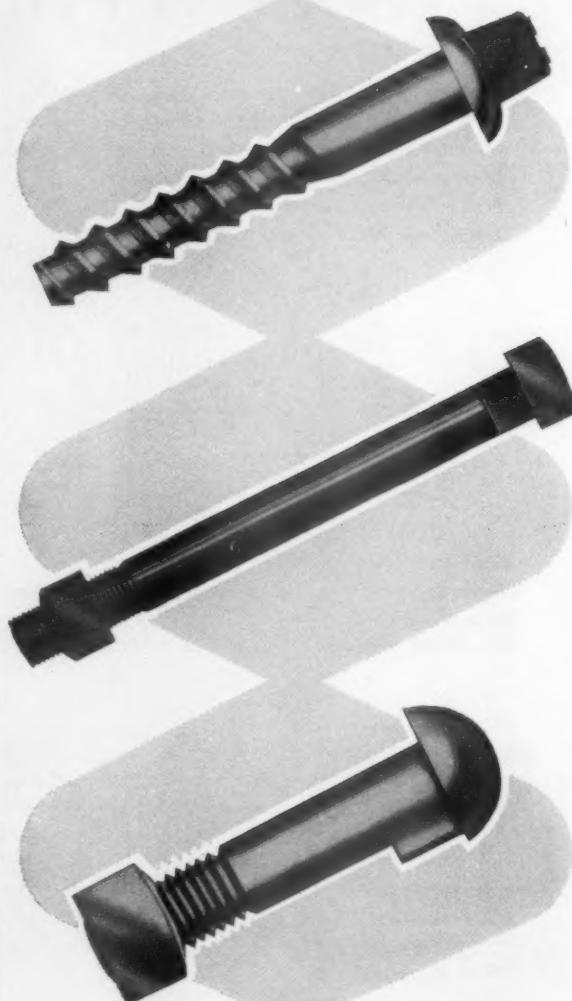
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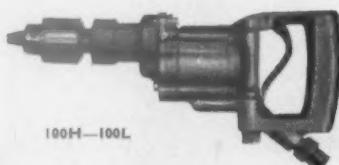
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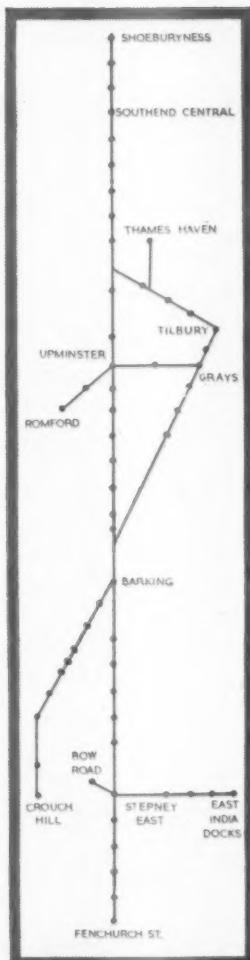
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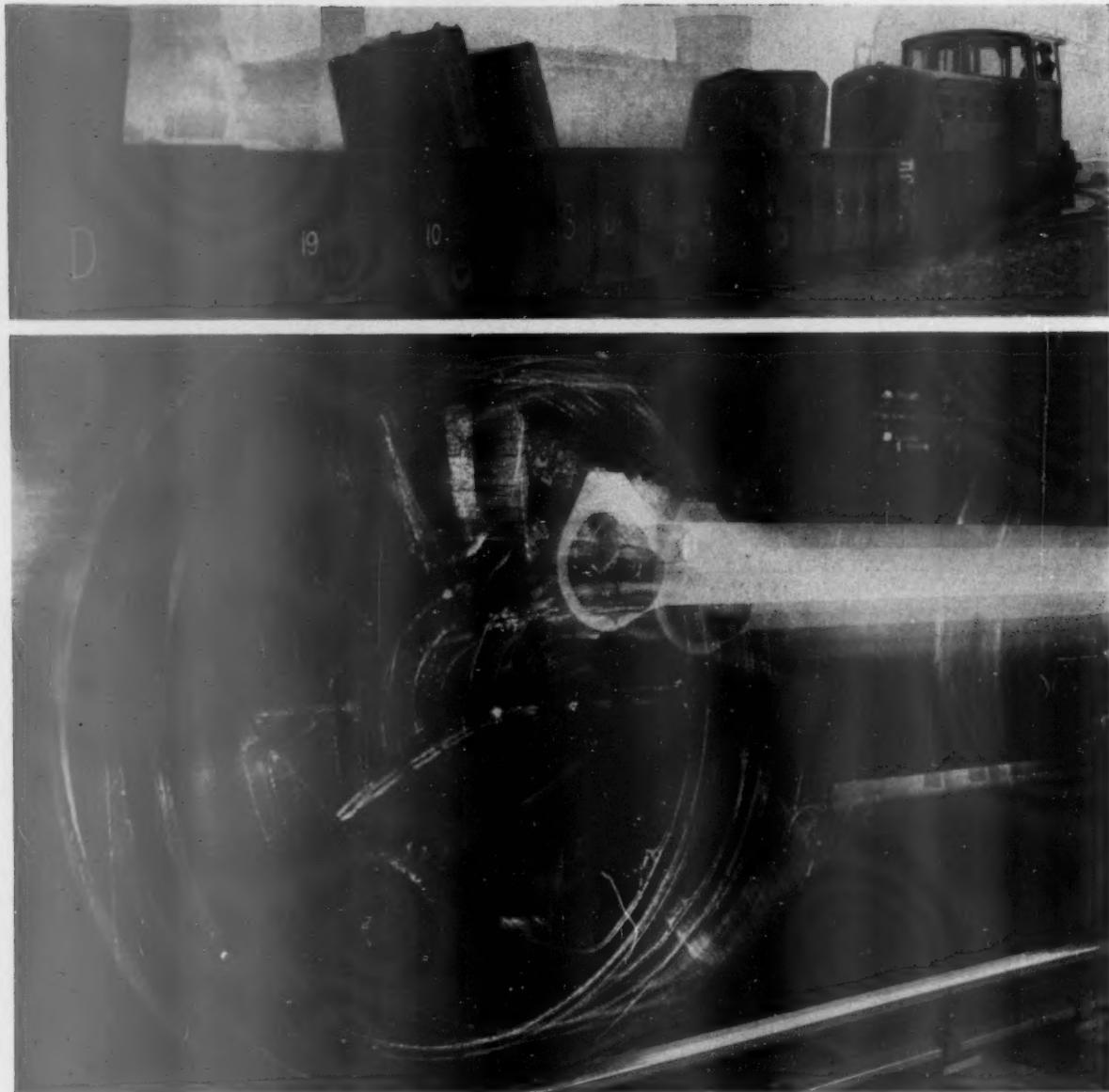
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